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The Old Châteaux of the Low Countries, and their Surroundings.

VERY few of the old Flemish châteaux retain their gardens and surroundings unaltered. The region in which the greater number of Flemish châteaux were situated was for a century the battle-ground of Europe, and before things had time to recover, most of the noble families to whom these estates belonged were ruined by revolution, their houses pillaged and burnt, gardens cut down, water-courses choked up, so that it is only here and there that we find a little nook of the pretty garden which has escaped; a broken moss-covered fountain, in which the Triton has been in vain blowing through the empty shell, from which the water has ceased to run for nearly a century; a terrace overgrown with weeds; or a picturesque summer-house forlorn and roofless. Fortunately, however, the engravings of Wenceslaus Hollar, Erlinger, Harrewyn, Vanweerden, Peeters, Vorstermans, Bruyn, Vanheil, and others have, in their illustrations of such works as "Brabantia Sacra et Profana," "Castella et Prætoria Nobillium Brabantiæ," "Les Délices de Brabant," "Les Délices de Holland," and the illustrations of a still earlier work, Aitsinger's "De Leone Belgico," left us carefully-executed bird's-eye views of so many of these buildings and their surroundings, that we are able, with a little study and care, to restore, mentally at least, the aspect of these beautiful homes of the old Dutch and Flemish nobles and country gentlemen; and when the difficulties of the situation are taken into consideration; when it is remembered how very little nature had done in the way of making this vast flat level country picturesque or pretty, we must admit that the art of rendering the surroundings of a house attractive and pleasant has seldom been so well understood or carried to so high a perfection as by the architects and gardeners of the Low Countries during the sixteenth and seventeenth centuries, and it is a remarkable fact that with such unpromising circumstances and conditions the Dutch set the example of gardening to the whole of the rest of Europe. We find imitations of Dutch gardening not only in England (in spite of the demolition of many of them wrought by "Capability Brown" and his school) and France, but even in Spain, Italy, and the south of Germany; in fact, one of the most perfect examples of a Dutch garden that we ever remember to have seen is that surrounding the little country château of the Prince-Bishops of Wurzburg at Veitshöccheim, in Bavaria. So far had the Dutch, in the opinion of the people of the time, overcome all the difficulties that surrounded them, that even countries which possessed all the natural advantages of hill and dale, and of varied and distant landscape, absolutely sacrificed it all for the purpose of obtaining a perfectly flat, level garden, after the manner of the Dutch.

It is not our purpose here to enter at any length into the question of the architecture of Dutch and Flemish houses, except so far as it affects the arrangements of their gardens and other surroundings. As a rule, they were generally somewhat square and formal in design and plan, for, the site being perfectly level, both convenience and appropriateness suggested a somewhat symmetrical treatment, and the general squareness of design was best suited for buildings which were to contain square apartments, with flat ceilings, lit by square-headed windows, entered by square-headed doorways, with walls usually constructed of brick with stone bands, all of which were dictated by necessity and convenience. These old Low Country châteaux were thoroughly suited to the wants of those who inhabited them, and were not only comfortable but cheerful and dignified dwellings; they had none of the ostentatious and pompous discomfort of the English "Classical" mansions: they had no useless Corinthian porticos darkening the windows, no sham pediments concealing the garrets, no imitation parapets to hide the gutters and make them leak into the bedrooms, no nymphs holding urns to serve as chimneys, no impracticable doors to keep some practicable one in countenance. Any symmetry or regularity which is to be found in them was the result either of convenience or necessity.

It is much to be regretted that so few of these interesting old mansions now remain entire. We come across them, however, in the districts surrounding Arnheim, Zutphen, Brabant, and Limburg, their stately avenues and extinguisher-crowned or bulb-capped towers adding a pleasant feature to the somewhat monotonous landscape. These spires or steeples crowning the towers are the only features that were purely ornamental, and did not result from necessity or convenience.

The principal buildings of a Dutch château were usually arranged round a square court with towers at the angles; examples, however, do occur in which the courtyard is polygonal or octagonal, as at Gœsbeke, Reves, Terelst, &c. This, which may be called the main building, was surrounded by a moat, which came right up to the walls, as is still the case at the great palace of "La Hague," and is shown in nearly all the illustrations in the works to which we have referred. It was approached by one or more bridges, one arch of which was replaced by a drawbridge and defended by a strong gate or tower, which served not only for the purpose of defence, but the upper story of which very frequently formed a clock-tower and dove-cot.

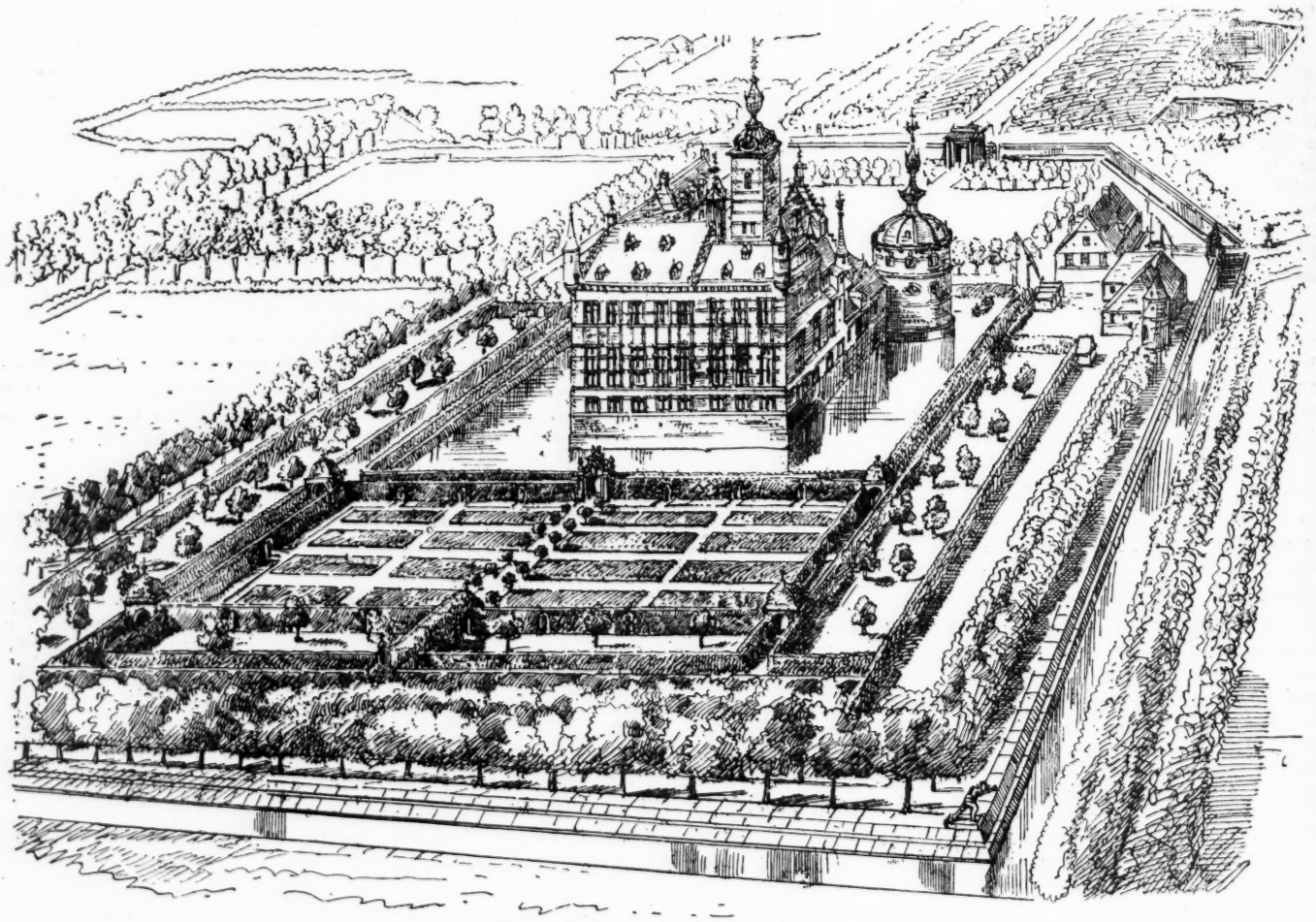
One of the bridges led to the Bas Court, where were situated the stables, farm buildings, granaries, &c. These were, again, generally surrounded by a moat, and approached from the road by a drawbridge and gate; not unfrequently the clock-tower itself was situated in the Bas Court. Another bridge usually gave access to the great garden, or pleasaunce, which was generally on the opposite side to the Bas Court, though there are examples of it being on the same side. The great orchard and the kitchen garden were close to the Bas Court, though sometimes divided from it by a moat. The whole of the gardens and surroundings were, again, enclosed by a large moat. Thus it will be seen that the space enclosed within the outer moat usually consisted of four islands, one of which was occupied by the principal buildings of the château, a second by the Bas Court, a third by the garden or pleasaunce, and a fourth by the orchards and kitchen gardens. Occasionally, though very rarely, the pleasaunce was on the same island as the main buildings of the château,—this appears to have been the case at Eversbergh. Amongst the principal buildings of the castle was always a large hall; it was, however, generally, not an independent structure like the halls of our English mansions, but was arranged in the lower story of the building with rooms over it. One example, however, the castle at Tergeuren, had a magnificent hall, just like our English Mediæval mansions. The chapel seems usually to have opened out from the hall, and in some instances the apse projects out over the moat, and is supported either upon a corbel or, as at Laer, upon columns and arches which rise out of the moat itself. At Herlier the chapel appears to have been in the Bas Court, but judging from Erlinger's view it appears to be of a very much earlier date than the buildings of the castle, and it is probable that they may have had scruples about removing it, though convenience may have dictated a different situation for the main buildings of the castle, as it is not to be supposed that, in the Middle Ages, they would have deliberately set down a chapel among the pig-styes and stables of the Bas Court.

The great garden, or pleasaunce, which forms such a beautiful feature in these Dutch châteaux, was nearly always placed in such a position as to be overlooked by the windows of the principal apartments of the castle. It was generally subdivided into square com-

partments by lofty clipped hedges, and sometimes by little canals and water-courses; the viviers or fish-ponds, which were such very important accessories to these houses, were generally placed in an isolated position, outside the pleasure-gardens, as at Haldenberge. This was not always the case, because the great moat round the house itself not unfrequently served the purpose, and at La Hague the moat is still called Le Vivier. This also appears to have been the case at Brochem,* near Lierre, which, judging of it from the four drawings given in Someres and Ravenstein's "Castella et Prætoria Brabantiæ," must have been, as far as its surroundings are concerned, one of the finest châteaux in the Low Countries. At Bouchaut, however, where there is another very fine castle, with buildings more Gothic in character than those at Brochem, although the moat round the castle is a regular lake as to size, we find three large fish-ponds as well; here, too, the moat is oval in form, and not large vivier with a narrow causeway separating it from the river. A large square garden of a very elaborate description stands in the midst of the vivier, approachable only by the causeway. Dams, waterwheels, and sluices are hinted at, or represented in these old engravings; these were erected for the purpose of preventing the stagnation of the water. The great moat round the house appears always to have been upon a slightly higher level than the water-courses and canals surrounding the gardens, and waste leats appear to have been provided in every case, so that the surface water from the great moat could be drained off and its depth regulated by any surplus being carried off into the canals, and through them to a general "escape stream." The edges of all the canals, viviers, and water-courses are cut rigidly straight, and are not unfrequently furnished with a stone or marble lip. This was not done for the sake of appearance alone, but as a sanitary precaution, only from 1757. Many of the illustrations are poor copies of those in Someres and Ravenstein. Several interesting facts, however, are brought to light by it; for we find that many of the châteaux had been rebuilt between the publication of the two works, notably the château at Breda, which had been re-erected by William III. of England.

The earlier engravings show very carefully the commencement of mischief in the buildings that are out of repair. Weeds are indicated in the moats, dams broken down, the edges of the ponds and canals are ragged and uneven, and the water stagnant; but where the mansions are in good repair we find everything neat and clean, and in good order,—swans in the moat, ornamental pleasure-boats on the canals filled with gaily-dressed people, and men fishing with nets and rods in the viviers.

We have alluded to the great garden, or "pleasaunce," which forms such a striking feature in the old Flemish country-houses.



The Château and Grounds of Brochem.

square or rectangular, as is usually the case. A curious feature also is the canal, which forms a second or outer moat, leaving a narrow causeway or strip of land between it and the great moat. The pleasure-garden and Bas Court have each the separate moat, and the avenues and water-walks are remarkably extensive.

At Diepesteyn the fish-ponds are shown very large indeed; in fact, they cover a greater area than the castle and grounds together.† At Leew the fish-ponds are also very large, and this castle possesses the rather unusual feature of a garden attached to the house and enclosed within the same moat. It is true that in addition to this little garden we have the pleasaunce as usual on the opposite side of the moat; another peculiarity is the fact that the Bas Court is between the house and the pleasaunce. All the best apartments of the house, however, looked on to the little garden within the moat, of course, not into the Bas Court; a small kind of jetty bearing a wooden structure, probably a bathing or fishing house, runs out of the pleasaunce into the great vivier.

The château of Loupouge has an unusually as it prevented the accumulation of weeds, scum, and vermin at the edges. With care and attention paid to regulating the levels of the water, and constant cleaning, these extensive waterworks were probably not so deleterious to health as is usually supposed; but of course, directly these precautions were neglected, and the sluices and dams allowed to fall into ruin, the effect was disastrous, and it is not surprising that the elaborate waterworks of these old châteaux became plague spots when the country was overrun by an invading army, the beautiful castle reduced to ruin, the gardens laid waste, the water-courses choked up, and the viviers overgrown with rank vegetation. Even when Harrewyn, Hollar, &c., made the drawings and engravings for the works which we have mentioned, several of the castles in Brabant had evidently fallen into bad repair, and some of them were completely in ruin. These views are not dated, as a rule, but we find upon Hollar's engraving of Antwerp Cathedral, in "Someres and Ravenstein," the date 1649, and there is every probabilty that the other views in this work were made about the same time. The work itself is dated 1694. "Les Délices de Brabant" is a very inferior book, and dates This usually was nearly square in plan, surrounded by a moat, and subdivided either by clipped hedges or small water-courses. In nearly every case there is a centre object,—generally a fountain. These fountains sometimes consisted of a small pond, with a *jet d'eau*, but more frequently they were elaborately and beautifully designed structures, with basins, statues, and architectural details, and would appear to have been constructed either of marble or metal work (probably bronze). A remarkably elegant one is shown at Percke, in the centre of a "pleasaunce," with very elaborately-arranged beds, clipped hedges, &c. (see plate). At Wemmele, a curious summer-house of clipped greenery forms the centre object (see plate); and in the "Château of the Lords of Daysbourg," a tall clipped tree occupies this position. The paths sometimes radiate from this centre object, thus subdividing the garden into triangular compartments; but more generally the subdivisions are square, the four squares nearest to the centre having their inner edges cut away in the form of four segments of a circle, so as to leave space for a circular path round the fountain or other central object. At Ter-Veuren, a very large and magnificent château, the great garden is

* See view of this château subjoined.
† See plate of lithograph sketches in this number.

subdivided into four equal squares. There is no object in the centre, which is simply formed by the intersection of four paths, but each of the four squares has its own centre object, which in each case consists of a statue upon a rather lofty pedestal, with a low-clipped circle of box round its base. Sometimes when the "pleasaunce" is large it is divided into two distinct parts by a little canal or a tall-clipped hedge, the communication between one part and the other being either by a bridge or by a little ornamental archway of clipped greenery. When this is the case the two portions of the garden are treated in a totally dissimilar manner, one generally having paths and hedges radiating from the centre, and the other laid out in squares. The great garden was nearly always inclosed by a tall clipped hedge, considerably higher than those forming the subdivision, leaving a pathway between itself and the canal or water-course, which formed the extreme boundary of the garden; sometimes this path had a tall hedge on either side. The hedges appear generally to have been 8 ft. or 10 ft. high, but those which formed the subdivisions of the great garden seem to have been about 4 ft. high. The spaces enclosed between the low hedges are either planted out as flower beds or planted with foliage of various colours clipped and arranged in elaborate patterns, not unlike those upon a Persian shawl. There are no indications of coloured earths being used; in fact, that kind of ornamentation was rather Italian than Dutch. Possibly the Italians, finding their climate too dry to get the plants which were clipped into these elaborate patterns in the Low Countries to grow with them, introduced the ornamentation by means of coloured earths as a kind of imitation.

There were always one or more summer-houses in the great garden or pleasaunce, frequently as many as four, one in each corner. They were most frequently composed of cut greenery, but were also occasionally of brick or stone. A good deal of elaboration appears to have been expended upon them. At Wemmele, Gaesbeck, and Percke there are good examples. Sometimes they were enclosed and had doorways and glazed windows, and were covered with domical roofs, but occasionally they were open all round.

A "Green Vault," composed of trees with their branches trained so as to meet overhead and thus shade the pathway, forming a delightful promenade in very hot or in wet weather, is another frequent feature. One is shown in our view of Brochem. Niches or archways cut in the tall hedges are also occasionally to be met with. These niches and archways are sometimes open, but not unfrequently they are filled with urns, statues, &c., as is also shown in the sketch of Brochem. Nothing could well be more beautiful than the effect of a white marble statue in such a position, and there is, perhaps, no more charming way of introducing statuary into a garden; the contrast between the white marble and the dark green of a clipped yew hedge is very beautiful.

The kitchen-gardens and orchards, which are often shown as being very extensive, do not call for any special description, as they were pretty much what those features of a country-house still are.

A belt of trees generally surrounded the whole domain, and a long avenue led up to the principal entrance or bridge leading to the château; if it was a large and important estate, there were several of these avenues, all radiating from the mansion. Ham House, near Richmond, in this particular strongly resembles the treatment of an old Flemish château, the kind of unenclosed park which surrounds it, and the long, straight avenues of trees, quite recall the surroundings of a château of the Low Countries. A labyrinth or a maze is sometimes to be seen, and what would appear to be ornamental vineyards seem to be indicated.

The little château of the Prince-bishops of Wurzburg at Veitshöccheim, to which we have previously alluded, possesses a most charming feature, though one which we should hardly have expected to find in the surroundings of an episcopal palace; it is no less than a complete open-air theatre, the auditorium composed of various tiers of seats all covered with green turf, and the scenes of the stage are entirely of clipped greenery.

We do not find, however, any indications of the great isolated conservatory or ball-room which is to be found in some English houses, notably Kensington Palace. Possibly this was a more modern introduction, and may have been an imitation of the garden-hall, or belvedere, of the Italian Palazzo. These structures certainly found their way into Germany. We find two very remarkable examples in Prague, in the belvedere of the king's garden, and the so-called hall of Wallenstein's palace. Amongst the buildings of the Bas Court of these Flemish châteaux, it is true, we occasionally find buildings represented with great open arcades in front, but these must have been carriage or cart sheds, the fact of their being always in the Bas Court must exclude any idea of their having been intended as pleasure-houses or ball-rooms. Terraces with urns and statues on their balustrades, which form such a striking feature in some of our old English gardens, would not appear to have been very popular in the Low Countries, as in all the views we have examined we only find three châteaux which exhibit them to any extent; the most important is that in the castle of the Baron de Steil and Overhem, and here the terrace seems to have been rendered necessary by the fall of the ground, a circumstance somewhat uncommon in the Low Countries.

Some portion of our description of these Low Country mansions, and their surroundings, may recall to the minds of our readers the gardens at Hampton Court Palace, and no doubt as originally laid out they were completely Dutch in character. The water-works, canals, &c., are still pretty perfect, but the gardens themselves have been nearly spoiled through the English landscape-gardeners; great bald lawns, and huge, wide gravel paths, beloved by English gardeners and hated by every man who has the slightest feeling for picturesqueness, now occupy the site of the trim clipped gardens of former times. The old yew trees, it is true, are allowed to remain, but they are absolutely out of place amidst their modern surroundings. Not content with ruining the gardens at Hampton Court, a few years ago the forecourt, with its beautiful wrought-iron gates and enclosures, which gave such a scale and dignity to the east front of the building, were removed, portions of them being stowed away in the South Kensington Museum. Surely there is sufficient artistic taste in the country to see the propriety of replacing these, and to admit that Sir Christopher Wren understood how to treat the surroundings of his buildings in a more appropriate manner than the modern landscape-gardener does it. The present huge gravel path, or rather gravel desert, out of which the building rises, is destructive of all scale, and gives it an isolated and forlorn appearance. Now, it is just this kind of dull, dreary, isolation which the Flemish builders, and, for the matter of that, the old English builders as well, did everything in their power to avoid. There can be little doubt that the gardens and surroundings of old houses were designed and arranged by the architect of the house himself, and it is for this reason that they always seem right in scale and appropriate to the building; whereas the modern landscape-gardener, knowing nothing whatever about architecture, looks upon a garden simply as a garden, without any reference whatever to its surrounding objects. He has an idea handed down to him from the "Capability Brown" school that a great, unbroken lawn "gives breadth," that a wide gravel path "gives a noble approach," and, consequently, he will give you these features whether your garden is 30 ft. or three miles square. Now, the old designers of gardens, before they planted a tree or laid out a path, considered how it was to affect the buildings and other objects which were in its proximity.

In addition to the reasons that we have given for a very careful and exhaustive study of the scale of surrounding objects, the Flemings and Dutch had a still further reason for studying this point in the laying out of their gardens. With them, distant views and even glimpses of a distant landscape were things to be thoroughly avoided. Even in England the Mediæval, Elizabethan, and Queen Anne house-builders never went out of their way to obtain extended views from their houses; it was left for the dreary Classical architects, at the close of the last and the commencement of the present century, to stick their mansions on the top of some bleak, desolate hill, pleasantly exposed to the east wind, and unsheltered from the sun's rays during the dog days. But the Dutch and Flemings had every possible reason for excluding distant views. A vast level tract of unbroken country, with a sluggish canal flowing through it, was not calculated to form an enlivening prospect from a drawing-room window, and they consequently took great care that there should be no outlet beyond the pleasant gardens, high-clipped hedges, and avenues surrounding the domain.

The conservatories, orchid houses, forcing houses, palmeries, ferneries, and other glass-covered buildings, which usually form such ugly adjuncts to our country houses, are, of course, not to be found in the ancient châteaux of the Low Countries; nor in the châteaux of the Low Countries do we find other hideous surroundings of the modern country house; they had no gas-works, engine-house, or steam-laundries to deal with. Whether they would have found some picturesque treatment for these hideous adjuncts of a modern country house we are unable to say, though from the pretty way in which they treated the various buildings of the Bas Court, from the beauty of all old barns, granaries, farm buildings, windmills, and water-mills, they might have hit upon some means of rendering these buildings at any rate less disfiguring to their surroundings than they are at the present day.

NOTES.

M. DE LESSEPS has made a new application to the French Government to sanction the emission of a lottery loan for the Panama Canal. The sum for which he now asks is 565 million francs, with a further and undefined sum for the conversion of some of the actual debt. If this new Loan is sanctioned, M. de Lesseps states that, "on the day of the opening, in 1890, the Canal will have cost one thousand and five hundred million of francs." This figure, however, large as it is, by no means represents the total cost at that date, according to the official statements made from time to time in the *Bulletin du Canal Interocéanique*. These comprise (1) the constituted capital of 300,000,000 francs; (2) the Loans of 1882, '83, '84, and '85, amounting to 629,833,500 francs; (3) the Loans of 1886 and 1887 (issued at 55 and 56 per cent. discount), which amount to 717,689,000 francs; (4) the Loans now in question, amounting to 565,000,000 francs, making a total of 2,212,522,500 francs, or 712,522,500 francs more than the sum now stated. It is not for us, but for the directors of the Canal, to explain this unparallelled discrepancy in their own statements. It is, however, the fact that the rebate or discount on items 2 and 3 amount, according to the annual balance-sheets published in the *Bulletin*, to 615,657,000 francs. This sum, though not received in cash, forms as integral a portion of the responsibilities of the Panama Company as any item of their capital; and the Company are under obligations to repay the whole of the larger sums, which we have calculated from their own numbers of obligations issued, at the date specified in the several conditions of Loan. We wait to see what explanation will be given of a misstatement which could hardly fail to mislead any public writer who had not access to the records published by the Canal Company. The *actif disponible ou réalisable* on the 30th of June, 1886, was 132,388,966 francs. The cash received for the loans of 1886 and 1887 (less any commission or banker's discount not published) was 320,371,180 francs. M. de Lesseps says that on January 1, 1888, the Company will have on hand about 110,000,000 francs, making the expenditure for eighteen months amount to

342,760,146 francs, which is equal to 13,710,400*l.*, or nearly 762,000*l.* per month. The excavation during the last six months of 1886 amounted to 5,044,000 cubic mètres, that during the first six months of 1887 amounted to 6,900,000 cubic mètres. In July and August of the present year 1,963,000 cubic mètres were returned; the cube of September not having been published in the *Bulletin* of the 2nd inst., which admits a considerable falling off in the monthly total, owing to rain, floods, and want of workmen. For the fourteen months, therefore, the monthly excavation amounted to nearly a million cubic mètres per month, instead of the three millions anticipated by M. Charles de Lesseps in March, 1886; and the cost, on the rough rule of dividing expenditure by cube of earthwork, was 15·24 shillings per cubic mètre. Thus if the excavation yet unfinished be reduced, as proposed, to forty million cubic mètres, and if it be executed at the actual rate of one million per month, three years and four months' work is requisite for this alone, bringing us to March, 1891. This, however, takes no note of the cost and time required for constructing 12,000 ft. run of locks, in a country where skilled labourers are now receiving 26s. per day. And if it be proposed, as appears to be the case, to run the canal level from either end until it reaches the 14 kilomètres of mountain, up which it is now proposed to raise the waterway, it is evident that the problem is not one of easy solution. As to the provision for the floods of the Chagres, the *Bulletin* of September 2nd last speaks of the commencement of the dam between Obispo and Santa Cruz, of which the last annual report of M. de Lesseps announced the abandonment.

THE judgment which Mr. Justice Kekewich delivered in the case of the Birmingham, Dudley, and District Banking Company *v.* Ross, on Saturday last, will, if it is upheld by the Court of Appeal, have a material effect on the administration of the existing law of light. There is a well-known principle of law that a man cannot derogate from his own grant: so that if A grant a building to B, and later on an adjoining piece of land to C, the latter cannot build so as to interfere with the light of B's house. In the case to which we have just referred, the Corporation of Birmingham demised to the plaintiffs' predecessor in title a house near a thoroughfare where new and important buildings were likely to be erected. They were erected on adjoining land, demised by the Corporation after that owned by the plaintiffs, and so obscured the plaintiffs' lights. Mr. Justice Kekewich held that primarily the above principle applied, and that the plaintiffs would, under ordinary circumstances, have been entitled to an injunction, but that the predecessor of the plaintiff in title "must be taken to have known what class of buildings were likely to be erected in a broad street in a commercial town." Knowing this, the plaintiffs were held not to be entitled to the relief which they would otherwise have received. This decision is in reality entirely a new one in point of law. It appears to raise many difficulties. For example: A man buys a house near a thoroughfare which is afterwards, and at a considerable distance of time, made an important street. Is the owner of this house bound to anticipate this change? We mention this as a possible difficulty, and showing the way in which the case in question may give rise to trouble. So long as the law of light in its present state exists we doubt both the practical wisdom and the legal soundness of this decision. There is also this to be observed, that the Corporation could have at the time of selling the house in question have made an agreement that a perpetual easement of light did not go with it. They not having done so, it seems to us the purchaser was entitled to believe that the usual easements went with the building he purchased.

AMONGST the various Bills for which application will be made by the Board of Works in the course of next session there are none that relate to any metropolitan improvement on an extensive scale; such as, for instance, to another Shaftesbury-avenue or Charing Cross-road. As touching their yet incompleted project of a direct thoroughfare from Gray's Inn-road, by the Holborn Town Hall, through Clerkenwell to Islington, the Board mean to ask for a two years' prolongation of the period, which is at present limited by their Various Powers Act of 1885. It seems that, whereas the Home Secretary has approved of the provision made by the Board for rehousing the working classes dispossessed in the region to the south-west of Farringdon-road, the Board still await Government sanction for their scheme as in continuation of the route. They are thus, in effect, hindered from purchasing more of the property along Exmouth-street and about Sadler's Wells. By the end of this current month the Board will have deposited with the various local offices concerned, all statutory plans, sections, proposals, and the like thereto, in connexion with their schemes, as follows. It is proposed to transfer and vest in the Board two plots of land in St. Giles's, Camberwell, parish, whereby approaches may be made to Dulwich Park from Court-lane and Dulwich Common-road, and to add the same to the Park which is already under the Board's control. Similarly, an extension of Kennington Park is contemplated, by including therein the piece of land that now lies between the Park northwards, and South-place. A recreation-ground for Lewisham will be provided by the enclosure and preservation as an open space of certain lands by the river Ravensbourne, and situated between Catford Hill and Ladywell. A footbridge will be thrown over the Mid-Kent railway, which passes through the ground marked out. At Fulham it is designed to improve the Middlesex approach to new Putney Bridge by a widening of Church-street. This involves the demolition of the houses along the southern side, and from School House-buildings along the northern side, of Church-street to where it meets the junction of the Hurlingham and King's roads. The Board of Works for the Poplar District will be called upon to contribute to the cost and maintenance of a bridge across the Limehouse Cut, with approach roads in Bromley (St. Leonard's parish), at a spot close by the North-Western and Dock Junction Railway. A new site, it appears, is chosen for the Thames Tunnel from Blackwall to Greenwich, somewhat to the west of that whose construction is sanctioned by an Act which was obtained in the session of this year. The Board again intend to apply for extended provisions under their Fire Brigade Act of 1865, with their Loans Act of 1869; and for power to inspect and license houses and other places of public resort used for stage plays, dances, music, or other enterments.

IT cannot be said that the Metropolitan Board of Works has rehabilitated itself in public opinion by its recent proceedings. What is called the "Robertson Scandal" has been the main theme of debate. It will be remembered that in July last the Board, after investigating the serious charges made against Mr. T. J. Robertson, principal clerk in the Estates office of the Superintending Architect's Department, came to the conclusion that he was deserving of censure. Incidentally arising out of these charges against Mr. Robertson, imputations, more or less vague, were made against the Board itself,—or a section of the Board, at any rate; and the Board, in answer to these imputations, took the very singular course of appointing itself as its own committee to inquire into its own conduct. This inquiry, as might have been expected, led to nothing,—partly, as is alleged by the critics of the Board, because the Board could not compel witnesses to come forward, and because the evidence given by such witnesses would not be privileged, as evidence given before a Parliamentary Committee or a Royal Commission would be. The Board adjourned for the recess, and the matter slept for a time; but one of the first acts of the Works and General Purposes Committee, after the recess, was to bring up a report recommending that "no further action be taken in relation to the vote of censure passed by the Board upon Mr. Robertson in July last." This was met by an amendment that "Mr. Robertson's engagement with the Board be terminated at the earliest period practicable." The amendment was lost, but only by three votes, and a further amendment, confirming the censure, was carried by a large majority. At the last meeting of the Board, a resolution was carried recommending that Mr. Robertson be removed from the Superintending Architect's department, and referring it to the Works and General Purposes Committee to consider to what position he should be transferred. At the same meeting a resolution was passed to the effect that if the Home Secretary or the Government cared to call for an independent public inquiry into the proceedings of the Board, the Board would give every facility for the holding of such inquiry. We hope that such an inquiry will be held, and that it will be thorough and exhaustive, for the Board and its officers ought to be placed above suspicion.

IT appears from a report by Mr. Wm. Crookes, Professor Odling, and Dr. C. Meymott Tidy, that the water supply of London during the month ending October 31st was of exceptional purity, as it had been during the three preceding months. During the months of July, August, and September the mean proportion of organic carbon in the water obtained from the Thames was 0·136 part in 100,000 parts of water, or less than one quarter of a grain per gallon. The supply during the past month was found to be practically identical with that of the preceding months; all the samples examined, whether derived from the Thames or the river Lea, were free from turbidity, and unexceptionable as regards colour. The public are warned that they must not expect this high standard to be maintained during the coming rainy season. The average degree of hardness was 13·19 degrees.

SIR GILBERT SCOTT'S design of the University Buildings in Glasgow, his largest secular work in Scotland, has now been completely carried out by the addition of the spire to the great central tower. Sir Gilbert's largest ecclesiastical work, the Cathedral Church of St. Mary, in Edinburgh, is imperfect as regards the two western spires and the chapter-house, which remain unbuilt. Dean Montgomery is exerting himself with a view to raising a fund to meet the cost of erecting the spires. This work, if carried out, will give to the church a marked individuality not only in the city, but as regards the whole of Scotland, there being no ecclesiastical edifice north of the Tweed having three towers or spires. Glasgow Cathedral did, of old, possess three such features, but the central spire only now remains.

THE value of sea-water as a sanitary agent is well known; for the flushing of drains and watering streets it is invaluable; and its use in the form of hot baths is of great benefit in many complaints. Such being the case, it is a somewhat remarkable circumstance that greater use has not been made of the inexhaustible supply where it is available. North Shields is one of the very few places which have been quoted as using salt-water for flushing purposes, and, we understand, with the most satisfactory results from a sanitary point of view. The matter has been taken up by certain members of the Edinburgh Town Council with a view to the introduction of a plentiful supply of sea-water into the city, and we have no doubt that if the object is attained a great boon will be conferred upon the citizens.

WE are desirous to give increased publicity to the following memorandum in the *Journal of Proceedings* of the Institute of Architects:—

"A prize of ten guineas for the encouragement of the study of stereotomy,—offered by the President of the Institute and three other members of the Council,—will be given next year to the candidate

who submits the best working drawings and model of 'Vaulting at an Angle of a Cloister.' The models will have to be constructed, probably, in the rooms of the Institute, and in the presence of moderators appointed by the Council. The competition is an open one, but, obviously, only those who have had previous instruction in the science of masonry will stand any chance of obtaining the prize. Mr. Harvey has therefore arranged to open a special class this December, which, he states, is to be limited to sixteen pupils. Thanks, however, to him, there are now other young architects in this country competent to give instruction in the science of masonry, and other classes of instruction may be held, if the applications to attend Mr. Harvey's special class exceed, as will probably be the case, the limit of sixteen which he has fixed. Moreover, all students of masonry will do well to read the paper by the late Professor Willis, F.R.S., on 'The Construction of the Vaults of the Middle Ages,' in the *Transactions*, 1842."

Mr. Lawrence Harvey's attainments in regard to the class of subject referred to, and his success in teaching it, have been frequently referred to in our columns. We are glad also to see that the solid learning and merit of Professor Willis's brilliant essay are not forgotten by the present generation.

AN appeal is made for funds for the repair of Fairford Church, Gloucestershire, for which the large sum of 3,000*l.* (large in relation to the size of the church) is required, of which sum about 700*l.* have been obtained from the parishioners of Fairford and their friends. It is expressly declared that no attempt will be made to "restore" the damage and decay from which the stained glass has suffered, whether from the action of the atmosphere or at the hands of iconoclasts. It is stated that the windows require re-leading and the roof immediate repair for the safety and preservation of the church. The re-leading of the windows will be done upon the spot, and only one light will be undertaken at a time. When fragments of glass are obviously misplaced they will be replaced in their original position by the aid of the late Rev. J. G. Joyce's monograph, read before the Bristol and Gloucester Archæological Society in 1878. No portion of a face or landscape which is missing will be replaced otherwise than by white glass; the fold of a robe, however, it is suggested, may be supplied by an unmistakable wash of colour on the white glass. The committee will have the assistance of Mr. T. Gambier Parry in dealing with the windows, and every effort will, it is stated, be made to preserve the glass *in situ*. The estimated cost of the repairs to the windows alone (with the necessary contingencies) amounts to 1,000*l.* Mr. F. S. Waller, of Gloucester, is the architect for the proposed works.

CAPTAIN MONRO, her Majesty's Inspector of Constabulary, has intimated to the Edinburgh City Authorities his intention to report that he considers the central police establishment defective in its arrangements and accommodation. There are certainly good grounds for Captain Monro adopting such a course, although it is hard upon the Corporation that they should be called upon to overhaul a building the execution of which was placed in the hands of the architect of the Board of Works (the late Mr. Nixon) so as to avoid the probability of what has now taken place. The building was erected about thirty years ago, and is most defective as regards planning. The police-court room, and the accommodation provided for witnesses, are such as to entail great hardship upon persons of respectability who, from no fault of their own, are compelled to enter the premises. The building is neither admirable without nor within, and it would, in the long run, prove the truest economy to make a clean sweep of it and erect entirely new premises either on the present or another site.

MR. AMBROSE M. POYNTER, son of Mr. E. J. Poynter, R.A., has recently translated for private circulation Dr. Pietro Saccardo's report on the principal works executed to the basilica of St. Mark at Venice during the year 1885, and proposals for additional works to be carried out in the year 1886, to which we referred at length a year ago (*Builder*, Dec. 4, 1886, p. 796). The report was repriuted in the publication called the *Archivio Veneto*, Series II., vol. xxxii., pt. ii., 1886. With regard to the works for the year 1886, the report concludes,—"We have before all to complete the repair of the principal façade in the last arches to the right, with which is connected the substitution of the antique slabs of marble on the south front as a work embraced by the same project and the same ministerial sanction. In the interior of this part the Capella Zeno has, of course, to be completed with the restoration of the semicircular part, very much decayed through the saltness of the air, and with the re-application of the slabs wanting to the rest of the walls. Besides these there still remain to be applied, as has been said, a few pieces of the antique mosaics of the vault; and that of the semi-dome ought to be taken down and replaced, preserving the two angels and remaking the figures of the Virgin with the Child, as they are now reduced to a mere blot of very bad restoration. For the model, not being able to count on the existing figure for an approximate reproduction, we shall have recourse to one similarly designed that exists in the semi-dome of the cathedral at Torcello, taking advantage of the scaffolding that is now there to make a tracing. . . . Turning to the exterior, we find that the lead covering of a part of the roof and of the cupola is in want of renovation. In this last it will be advisable to make use of old sheets of lead in the parts which are visible from below in order to preserve their antique and picturesque aspect. The walls of the three lunettes above the façade have still to be restored, and the gables that belong to them, with their decorations in marble, as well as the two pinnacles placed between them." It may be assumed that the whole of these works have by this time been carried out, and, as will be seen, a part consists of a restoration of a restoration.

BY an order of the Ministry of Public Instruction of Fine Arts, published in the *Journal Officiel* of November 20th, the "Service des Monuments Historiques," which has since 1879 had possession of the east wing of the Trocadéro Palace for the establishment of a Museum of comparative Sculpture, is authorised to take possession of the west wing also, to give a further development to the museum, which will be indispensable in order to complete the series of works by French sculptors.

IN the Edinburgh Dean of Guild Court, held on the 17th inst., plans for the rebuilding of Newsome's Circus,—recently destroyed by fire,—were approved of. The new building will accommodate about 3,000 persons, and will cost about 5,000*l.* Noncombustible materials are to be used in every instance where practicable, and the seating is to be coated with asbestos paint. The general feature inside is an amphitheatre where no part of the audience will be over another except at the main entrance, where a small gallery is to be placed. In the event of a panic no less than eight separate exits will be available. An endeavour is to be made to push forward the construction of the building so that it may be ready for the Christmas holidays. This hasty mode of construction often leads to imperfectly-executed work, and is the cause of many of the mishaps which occur.

WE are very glad to find that between the liberality of the British School at Athens and that of the President of the Institute of Architects, who have each contributed 50*l.*, there is a travelling studentship in Greek archæology worth 100*l.* to be competed for. It is not very clear whether the studentship is to be regarded as in connexion with the Institute or with the School at Athens; the latter proposed, the Institute is the authority to be applied to for particulars, so we presume it is a joint matter between the two Institutions; but the position is not very clearly defined in the note in the *Journal of Proceedings*, except that the terms and conditions are to be obtained "only at the office of the Institute." The selected student will probably have to start for Athens early in January, and there hold himself at the disposal of Mr. Ernest Gardner, the Director of the British School.

THE manager of the Donegal Industrial Fund, established to encourage Irish Industries, having invited us to look at some specimens of the work lately produced by distressed Irish ladies and by Irish peasants, we have visited the depôt of the Fund at 43, Wigmore-street, and examined a small collection of *portières*, curtains, and other embroidered and lace fabrics, which exhibit excellent taste and skill, and look as if they ought to be exceedingly durable. The materials used are, almost without exception, of vegetable origin, and chiefly flax dyed with vegetable dyes to a variety of pleasant, soft, or sober colours. The designs are well drawn, and exhibit a very judicious restraint, and considerable knowledge and skill in the combination and distribution of forms and colours. The material has, unavoidably, a somewhat hard and coarse look when closely examined; and the majority of the ornamental patterns, founded on Celtic originals, appear a little coarse and barbarous beside the more delicate ones imitated from Italian work; but if the two are not seen together this objection is not apparent, and the simple vigour and conventional forms of the earlier style are in themselves very pleasing.

THE cities of the Lombard plain, between Brescia on the east and Vercelli on the west, possess supremely fine examples of two schools of architecture, the brick and terra-cotta of the thirteenth, fourteenth, and fifteenth centuries, and the Early Renaissance or Bramante school. The Tower of Chiaravalle, the little façade of the Church of St. Maria in Istrada at Mouza, and the Certosa of Pavia, are three notable examples of the former. The sacristy of St. Satiro at Milan, the Churches of S. M. Incoronata at Lodi and Pavia, and the parish churches of Saronno and Busto Arsizio are the finest examples of the latter. Lovers of architecture and the allied arts travelling in Italy often miss seeing these and other important but comparatively out-of-the-way works of art, for want of having their importance duly insisted upon in the usual guide-books. "Como and Italian Lake-Land," * by the Rev. T. W. M. Lund, though not a guide-book in form, is such in fact, with this further advantage, that it is evidently written by a man of taste and learning. It covers all the artistically important part of Lombardy, as well as the district named in the title. Intending travellers will do well to bear its existence in mind.

THE article on "Architecture" in the "British Almanac and Companion for 1888," is a forcible and well-written sketch of the architectural work of the year, accompanied by some sensible and outspoken criticism on various points, concerning most of which we have already expressed ourselves to pretty much the same effect. The writer is an advocate of progress and an opponent of copyism, in which also we are with him.

WE have received from Messrs. Josiah Wedgwood & Sons a very elaborate illustrated catalogue of their tile designs for floors and walls. The reputation of this firm is, of course, historical, and we have no doubt the tiles are of excellent quality; but as they invite our criticism we cannot help expressing our surprise that manufacturers whose name has been connected with so much artistic work in the past should not have made more effort than appears here towards the production of what could be truly called artistic designs, instead of mere patterns on the old well-worn lines of squares and cross checquers and diamonds. Of course, it is necessary to have a certain number of easily-executed designs which will not be too costly for ordinary work; and the makers may say, no doubt, that the real object of a pattern-book is to show how every-day demands may be supplied. We find, however, little or nothing beyond this every-

* London: W. H. Allen & Co. 1887.

day quality. We have no positive objection to make against the designs, unless with regard to the colour of some of them (No. 169A, for instance, one of the largest illustrations, is a very crude and harsh combination of predominating greens and reds); our complaint is that they are entirely uninteresting, and show no thought, invention, or feeling for artistic effect in the higher sense. To arrange bands and squares crossing each other, with different arrangements of squares and lozenges for filling in the centre, is a kind of thing that a child can do if you give him the pieces to put together; and among all the floor patterns we cannot see a single one of which we can feel that we would desire to lay our floor with for the pleasure of seeing it. All that can be said is that they are neat and more or less effective, and will "do" very well for their purpose. But surely something more may be done even with machine-made tiles than this. The designers came rather near evolving something in Nos. 171A and 173A; but they cannot escape from the mere juxtaposition of alternating arrangements of squares, &c. A study of such designs as those of the Arabic school might have suggested the step further in invention and contrivance which would have removed these from the category of "patterns" to that of "designs."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second ordinary meeting of this Institute for the present session was held on Monday evening last, Mr. Edward I'Anson, F.G.S. (President) in the chair.

Gifts to the Library.

Mr. J. Macvicar Anderson (Hon. Sec.) said it was not customary at the ordinary meetings to put forward presentations, but two gifts which had just come into their possession were of such special interest that he wished at once to acknowledge them. The first was a chromo-lithographic view of the Tower Bridge, sent by direction of Mr. George Shaw, Chairman of the Bridge House Estates Committee of the Corporation of London. Considering that this was one of the last works of the late Sir Horace Jones, Past-President, it possessed exceptional interest for the members of the Institute. The other presentation was "Architectural Drawing," by Mr. R. Phené Spiers, any work emanating from whom on such a subject must be of considerable value and interest.

Mr. Charles Fowler drew attention to a donation to the library which would be made in the course of a day or two. It had occurred to him that the Regulations of the Metropolitan Board of Works, on the various matters concerning buildings, did not exist in the library in a collected form. He had, therefore, asked the Superintending Architect to kindly furnish him, for the library, with a copy of the Regulations, and had obtained them in duplicate. These, he believed, would be more particularly useful to the younger members who were thinking of passing the District Surveyor's Examination.

Mr. C. J. Phipps, F.S.A., remarked that the Regulations were very illusory. When they had followed every line of them it would be found that the Building Act Committee of the Board wished a great many things more. In fact, they were not of the slightest value (laughter).

The School of Athens.

The President drew attention to the fact that the School of Athens had invited students to come there and study for four months, the only condition being that they should be prepared to assist in the excavations. The School was prepared to contribute 50*l.* towards the expenses of any student who desired to avail himself of the invitation, and the Institute was prepared to add another 50*l.* Application should be made before the 10th proximo to the Hon. Secs. of the Institute. There was only one studentship at present.

Mr. Macvicar Anderson said he must correct the President in one particular. The Institute was unable to contribute the 50*l.*, but Mr. I'Anson himself had liberally offered to find the additional 50*l.* out of his own pocket (applause).

Building and Decorative Stones of Egypt.

Mr. W. Brindley, F.R.M.S., read a paper on "Building and Decorative Stones of Egypt," of which the following is an abstract:—

Limestones.—The Egyptian quarries, which played an important part in the architectural history not only of Egypt but of the ancient Roman Empire, were nearly all on the east side of the Nile. The Pyramids being the most ancient and impressive remains, the author commenced by considering the material used in their construction. There had originally been seventy, of which twenty still existed. Much of the stone used was a nummulitic limestone, quarried on the spot in cubical blocks and built in steps. The triangular casing was a fine cream-coloured magnesian limestone, quarried at Toora and Masarah, and all cut out of the solid rock to the size required. Except in a few lower ones recently unearthed, these stones had all been used to build modern Cairo. A fragment shown by Mr. Brindley, which had the vertical and horizontal joints (giving the angle correctly), showed the surface wear of 4,000 years, with the original tooling of the joints. No stone could have worn better. The quarries immediately behind Thebes were of fine limestone, to which the Egyptians were very partial for sarcophagi and small sculptures, owing to the extreme fineness of the grain. It was like close chalk, only much harder and of warmer colour, and occasionally contained brown flints.

Sandstones.—Next in importance sandstone had been mostly used for the building of temples. It was of a warm grey colour with fine texture. The quarries, which were at Silsileh, consisted of extensive grottoes and open spaces, where the workmen had followed the best beds, cutting out the blocks with the greatest care and tooling them on the spot. They were then floated down the Nile on rafts. These stones were usually set dry, the finished faces afterwards being coated with stucco, in some cases hardened with albumen or gum, to receive colour decoration.

Granites.—The famous granite rocks of Syene formed part of the igneous range running parallel with the Red Sea. The ancient quarries were in the Eastern Desert, about two miles from Assouan (the ancient Syene) and very extensive, but the deepest not exceeding 80 ft. In the first was the so-called unfinished obelisk, which was a dressed mass of rock attached on the bottom bed and back to the parent rock; the length was 95 ft. and the width 11 ft. It had a series of transverse cuts on the top bed, indicating blocks for sarcophagi. Mr. Brindley had come to the conclusion that it was not an obelisk, but a bed of stone, dressed by a gang of task-workmen or convicts, to be cut up into sarcophagi, and that it was work of the Roman period.

Mons Claudianus.—The grey granite "Lapis Psaronius" (spotted like a starling) had been extensively used in Rome for the Forum of Trajan and the monolith pillars of the Pantheon. The quarries, which appear to have been worked only by the Romans, were near the porphyry quarries between the Red Sea and the Nile, and ruins of workmen's huts, a temple of the Roman era, and monastic buildings of a later date still existed there. They appear to have been worked only by the Romans. Mr. Floyer, in a letter to the author, states that pillars, 59 ft. by 8 ft. 6 in. diameter, accurately wrought, were still in the quarries. In history they were called the quarries of Mons Claudianus, but must have been worked previously to that period as they had been used for the Pantheon.

Durability of Granites.—The granites and syenites of Egypt had not worn well, compared with some inferior stones. The decay was chiefly from the peeling off of the polished surface. Patches, a few feet square and about an inch in thickness, all loose and ready to drop off at the slightest touch, were to be seen. The great polished blocks in the Temple of the Sphinx appeared generally sound, but if tapped with the rule sounded hollow, and the obelisks at Karnac were peeling. It should, therefore, be remembered with regard to our Cleopatra's Needle that we had not received it sound.

Imperial Porphyry.—The ancient Egyptians appeared never to have discovered their most beautiful stones; this had been done by the Romans, whose men of science had not neglected even places most difficult of access. For example, a noble red purple stone had been found on the summit of a desolate mountain 4,000 ft. high and 100 miles from habitations. A colony was established of thousands of workmen, who received their provisions from the Nile, stations being built, wells sunk, and huts erected on the route. This route Mr. Brindley and his wife had journeyed over on camels from Keneh, for thirteen days, in order to visit the quarries.* The Bedouins in whose charge they had been were most trustworthy, and far more intelligent than is generally credited, having been most useful in Mr. Brindley's researches. The quarries were on Gebel Duchar (the mountain of smoke), which rose abruptly out of the plain in the shape of a long horseshoe; the valley between containing a small town, wells, and reservoirs, with a temple, in pink granite, of small dimensions. In addition to many ordinary roads and footpaths there existed the remains of two grand block roads, with piers at the sides for lowering stupendous blocks by means of ropes. The porphyry was in masses, some 120 ft. wide, while many of the choicest varieties were only about 10 ft. wide, and appeared to have been upheaved through a mass of granite and black shaley trap rock, the granite being burnt apparently through the heat of the porphyry. The whole mass appeared of fairly uniform texture, but some of the obtrusive parts were very different, being volcanic worn masses of variously-tinted porphyry boulders embedded in a purple felsite paste. This gloriously coloured stone was the only one in the scale of colour the Romans lacked, and it had never become a commercial material, having been Imperial from the first, and worked only by and for the State. There still existed about 300 monolith porphyry pillars in Europe, and the stone was to be found in Asia as far as Baalbec and Palmyra. In all cases it still retained its freshness of colour, proving beyond a doubt its durability. The Romans had evinced great partiality to porphyry for sarcophagi. That of Nero was the first mentioned, and the largest known to exist were those of Helena and Constantia, the mother and daughter of Constantine the Great, now in the Vatican. A room named the "Porphyrea" in the Imperial Palace at Constantinople had been lined with porphyry brought from Rome by Constantine; and in the reception-hall of that palace there had been a large porphyry slab under a baldacchino, on which the Emperor stood at great festivals. What with Christian conquerors at Constantinople and Doge Dandolo little now remained. The most important monument erected by Constantine was the column 100 ft. high, built with eight cylindrical pieces, each 11 ft. long, and this was still standing, although damaged by fire and earthquake.

Opus Alexandrinum.—A great quantity of precious porphyry had been cut up for pavements in early Christian times. Some of the circular plaques were very large, one in St. Peter's being 8 ft. 6 in. across. According to Dr. Schneider, Prince Charles of Prussia had formed the most famous collection of ancient porphyry works of art, including a colossal statue of Minerva and a grand pavement of opus Alexandrinum, brought from Ravenna. Amongst the works in porphyry in this country might be mentioned the plaques and pavement to the royal tombs in Westminster Abbey and the pavement under "Becket's crown" at Canterbury. The South Kensington Museum contained some very beautiful examples of Renaissance and French work, and the British Museum some of the Byzantine period.

Marble Verde Augustus.—This was a green serpentine, and was called by other names according to the variations of the markings. It had been used by the Egyptians for small figures and by the Romans for articles of *vertu*. In the desert at Diu Station there had been workshops for small articles in porphyry and this serpentine. Mr. Mitchell, the geologist, had found it in an adjoining mountain while making his interesting collection of rock specimens of the Red Sea formation, which is now part of the new museum at Cairo.

Oriental Alabaster.—The lapis onyx or marmo Arabicum of the ancients was called onyx owing to its semi-transparency, like the finger-nails. A number of old quarries had been discovered, and those near Benis-ooef had been re-worked for the great mosque of Mohamed Ali at Cairo. Alabaster was a favourite material with the Egyptians and Greeks, taking its name from the vessels for perfumed ungents

* See account of this journey in the *Builder* for the 12th inst., p. 683.

called "alabastra," and was for domestic purposes and the interior decoration of temples, as well as for sculpture and sarcophagi. The grandest sarcophagus yet discovered was that in the Soane Museum. Egyptian alabaster was usually white and yellow, with occasional thin markings of red and purple. Alabaster had been used by the Romans and Greeks for every description of decorative work.

Breccia Verde.—This was a very beautiful and rare marble conglomerate, found only in Egypt. The general colour was greenish, due to the quantity of green granite boulders, in addition to which were pieces of porphyry, red jasper, green felspar, different kinds of slatey rock and serpentine; the whole being cemented together by a greenish silicious paste. The quarries had been known and worked by the ancient Egyptians and were situated at Hammamat. There was a considerable quantity in Rome and Constantinople obtained during the Roman occupation, and during the Renaissance period much old material had been cut up for ornamental purposes by the French and Italians.

The various Anathites. — Dionites, felsites, and all similar very hard stones, used for sculpture and mummy cases, were all dykes or intrusive veins formed in the igneous rocks at Syene and in the Eastern desert.

Gems and Ornamental Stones.—The Egyptians had been great lapidaries, and used nearly every sort of gem stone known to us, except the diamond, ruby, and sapphire. The emerald mines at Gebel Zabara had been worked from early times down to that of Mahommed Ali; the gold mines were at Gebel Allakee, south of Assouan, and copper was obtained near the porphyry quarries.

Quarrying and working hard Stones.—Mr. Brindley was of opinion that the Egyptian methods were precisely the same as our own were up to a few years ago, viz.:—heavy pick tools for scrubble dressing and making holes for wedges, the blocks being split with metal wedges; dressing masonry surfaces with large and small picks; then rubbing down with flat stone rubbers and sand; and finishing with bronze or copper rubbers and emery powder. The wedge holes, plentiful enough in the granite and porphyry quarries, were the same as ours. Some Egyptologists thought they had discovered the results of gem-stone drills and saws by a few holes and slabs being striated, but a piece of granite (exhibited) bored with a copper tube and coarse emery powder produced the same result as found in Egypt, while Dr. Schliemann had told the author that he thought the stone hammer-heads of pre-historic times were bored with wood and emery powder.

In the discussion which followed,

Mr. Waterhouse, R.A., in proposing a vote of thanks to Mr. Brindley, remarked that he had always considered porphyry was to building materials what the diamond was to other gems. It had hitherto been out of the reach of the ordinary architect, but he hoped Mr. Brindley would tell them something about the re-opening of the old quarries for the benefit of the present and future generations.

Mr. Aitchison, A.R.A., seconded the vote of thanks. Mr. Waterhouse's remarks as to porphyry were perfectly true, and he was afraid that although the quarries were re-opened, it would not be available at a much lower rate than before. Even when landed on the shores of England it was a desperately hard material to cut, and would consequently be still very costly. He had had little opportunity of using porphyry, but what he had used had generally cost at the rate of 5*l.* per foot super., and that ½ in. thick. He had used it occasionally for slabs and pavements, much in the same way, but on a smaller scale, as it could be seen at Rome and elsewhere. The *opus Alexandrinum*, he believed, was so termed not because it came from Alexandria, but because it was patronised by Alexander Severus. Many of the marbles, granites, and porphyries were magnificent materials for ornamenting the interiors of buildings, and porphyry had the peculiar advantage of becoming more and more polished by the agency of the traffic over it. Hard materials generally would polish under the heaviest traffic, and some of the hardest granite laid down in the streets of London had had to be removed because it became too highly polished, and consequently very slippery. Some years ago, when he was at the St. Katharine's Docks, he found the staircases of the warehouses so polished by the continual running up and down of the labourers, that it had to be roughed every few years to prevent people slipping.

Mr. R. Phené Spiers, F.S.A., said that one of the most interesting points referred to by Mr. Brindley was the extraordinary preservation of the materials in Egypt, and it was impossible for those who lived in this damp climate to understand what a great element of destruction moisture was. Mr. Brindley had referred to the action of intense heat and cold on granite, but he (the speaker) had no idea that so much destruction of stone and granite surfaces could be produced without moisture. As an instance of the extraordinary preservation of materials, he might note one of the rock tombs standing opposite the Island of Philæ, with an inscription which, though it appeared to be of modern date, was really of the time of Rameses the Great.

Mr. Aitchison asked Mr. Brindley, in his reply, to say if anything was known as to where the porphyry enrichments of the tombs in Westminster Abbey had come from.

Mr. Topley, F.G.S., of the Royal School of Mines, said that Mr. Brindley had correctly asserted that alternations of heat and cold had as much effect in the disintegration of rocks as moisture had. The great agency of water in northern climes was by its freezing and expanding with enormous force, and thus breaking off the rocks. What happened in dry climates was precisely the same, but from an opposite cause. The great alternations of temperature between day and night acted so strongly in the contraction and expansion of rocks that they broke off as rapidly from the action of extreme heat as they did from intense cold. So much was that the case that he had been told that travellers in Arabia were sometimes woke during the night by a cracking all round, due to the contraction of the rocks which had been expanded during the daytime. An interesting question had been raised by Mr. Brindley as to the composition of the rock he had referred to as being red porphyry. Several papers had been written on the subject, but it was evident that the writers of them had examined the rock only in small pieces, and had not had the opportunity now afforded of seeing such large slabs. It had been spoken of as Breccia, and the first glance would lead one to think it was, but it would be well to have a further examination made of the larger specimens. Mr. Brindley had referred to the mosques near Cairo, but nothing had been said about the most wonderful mosque of all, viz., that of Cordova, which contained some 1,200 or 1,300 columns brought from all parts of the Mediterranean.

Mr. T. Graham Jackson, M.A., considered that Mr. Brindley was practically the rediscoverer of those porphyry beds, but whether it would become a material to be used by architects remained to be seen. If porphyry and green serpentine could be in any way brought within the compass of ordinary means it would be a very great aid to the development of schemes of permanent decoration.

Mr. Freeman (Penryn) believed that some of the hieroglyphics showed the means used by the ancient Egyptians for transporting large blocks, but he was not aware that there was any indication of the way in which the masses of rock were detached. The method of cutting up a detached block was comparatively simple, but we had no knowledge of the ancients having had any explosive power. He believed that of late years great advances had been made in the working of those very hard materials, which would tend to introduce the much greater use of porphyry. There were now processes of sawing the porphyry and granite, by which as much work could be done in one hour as used in the olden times to occupy two days.

The vote of thanks was then put and carried with applause.

Mr. Brindley, in replying, stated that the ancient quarries of porphyry were situated about 100 miles from the Nile, and about twenty-two geographical miles from the coast. From the quarries to the coast there was a gentle incline all the way, and the district was now being surveyed for him. There were hieroglyphics and sculptures in the quarries which showed the ancient methods of drawing by oxen and slaves. With regard to the reworking of the quarries, he hoped to be able to ship the stone at the port of Myoshomus, and bring it to London *viâ* the Suez Canal, selling it here for about 3*l.* per foot cube. Hitherto he had had to pay 8*l.* per foot cube. He possessed a column for which he had refused 700*l.*, but he was afraid now he would have to take less for it. He had received a piece of porphyry bored at Mr. Freeman's Granite Mills in Cornwall at the extremely rapid rate of ½ in. per hour. The serpentine should not be confounded with the English serpentine, or with that of the Italians. The latter was used with red porphyry, which came a few miles from Sparta, in Laconia. Its component parts were the same as those of the other porphyry, with a little colouring matter. As to the porphyry in Westminster Abbey, it was recorded that certain Italian workmen brought their materials with them, and the chips found in the Chapter-house were those which were knocked off. He was not the first discoverer of the quarries in modern times. Burton visited the quarries about 1832, and shortly after Sir Gardner Wilkinson wrote an interesting account of them, but did not bring away any chips. Lepsius had also visited the quarries, but the man who had done most was Schweinfürth, who had carefully surveyed and mapped the district.

APPRENTICESHIP AND TECHNICAL EDUCATION.*

UNTIL the present time there have been,—at least in the majority of mechanical trades,—only two recognised kinds of apprenticeship. In one the apprentice, entering at about fourteen years of age, served his seven years as a workman, receiving for his work practically nothing beyond instruction in his trade, save a small pittance for his weekly maintenance, which may be taken to represent the modern equivalent of the board and lodging which in olden times the master gave his apprentice in his own house. In the other the young man is received into the works at the age of eighteen or nineteen as a premium pupil, to serve an apprenticeship of a very different and often very unsatisfactory kind.

But now, it would seem, there is a third sort of apprenticeship arising, in which the technical college or school plays a part; the work of the technical school or college being either preparatory or supplementary to the commercial apprenticeship in the shops. This remark must not be misunderstood. It is true that in France, and, to some extent, in Germany and elsewhere, a fourth kind of apprenticeship has been attempted, namely, one in which a training wholly within the walls of a college or school was substituted, or supposed to be substituted, in the place of an industrial apprenticeship. There is no need to refer to this matter in detail, because this kind of training does not exist in England, nor does it seem as if such would ever meet the requirements of British industries.

Assuredly, that is not the aim of the few existing British technical colleges and schools; they aim to supplement, not to supersede, the actual experience of the shops. The writer can answer for it that no Finsbury student imagines that the work of the College can supersede the work of the shops. In the case of the day students, they know full well that their work is but preparatory; in the case of the evening students that their work is only supplementary. It is really a great gain to the members of the teaching staff that they come into contact with both kinds of student. It helps to preserve the balance in the character of the teaching, that it shall neither grow, on the one hand, too theoretical, nor yet, on the other, degenerate into merely teaching that which can be better taught in the shops.

There are, indeed, other ways in which technical teaching and industrial experience can be combined, as, for example, the way that has been followed out for some six or seven years with marked success in the Engineering Department of the University College of Bristol. That institution has induced a number of local engineering firms to enter into an arrangement whereby the engineering students spend the six winter months only at the college, and the six summer months in the works; the course extending over about three years. Of course these students enter works as premium pupils, not as working apprentices.

* From a paper read by Professor Silvanus P. Thompson, Principal of the City and Guilds' Technical College, Finsbury, at a Conference on Technical Instruction, held November 5th, 1887:

The aim of the Finsbury College differs distinctly in this, that its two years' course is designed to obviate the subsequent payment of a premium, and to enable the student when, at the age of about seventeen, he enters the works, to take his place there as a working apprentice the same as if he had been already apprenticed there for three years. This is, therefore, an attempt to create a modified apprenticeship lasting not more than five years, wherein the College course takes the first two years and the shops the last three. The success of the system has certainly surpassed the expectation. There now are, and their number is certain to increase, a few masters who, when they take an apprentice for a term of five or six years, expressly stipulate that they shall send their apprentice to the Finsbury Technical College for the first two years. In some cases they pay the fees for the apprentice. Perhaps the time will come when the parent who apprentices the boy will on his part insist that the master shall send the apprentice for the first two years for a preliminary technical training. Many parents of small means do not quite like to take the responsibility of sending their boys for two years to a technical school or college on the chance that at the end of that time they may be able to find a master willing to take them for a shortened apprenticeship of only three years. Amongst our day students we have, as remarked above, a few who are actually apprenticed. One well-known electric-lighting firm which takes pupils at a very high premium, has voluntarily offered to the City and Guilds' Institute to take one student every two years in regular succession without premium, as a pupil. In another instance, an employer, who takes pupils at moderate premiums, makes it a condition that every pupil shall attend a regular evening course of instruction at the Finsbury Technical College. The evening class fees at this College are in every case reduced to one-half for apprentices, whether indentured or not, and under this regulation there are some 250 apprentices attending the evening courses. In one case, a few weeks ago, a youth applied who had just had his indentures cancelled because his master was either unable or unwilling to teach him his trade, but kept him at odd jobs.

Now these things seem to indicate that this question of apprenticeship is really entering upon a new phase with the growth of technical classes. The new phase is certainly worthy of the attention of masters, and will assuredly receive sooner or later the attention of the various trade societies and organisations. Indeed, it is to be hoped that they will see their way to helping forward the movement. It is obviously to the interest of the various trades that the apprentices who have entered it should be as well and fully trained as possible. If, owing to the altered conditions of the time and the division of labour, the masters are unable to teach the apprentice his trade, then it should be regarded as a moral obligation (to say nothing of legal obligations) upon the master to afford his apprentice every facility for obtaining the instruction that he fails to impart. Nay, ought he not to do more than merely afford facilities; ought he not to provide them? Do those cabinet-makers of the Finsbury district, who will not let their apprentices come to the Technical College classes at half-past seven to learn the technicalities of their craft,—for there are, unfortunately, some who will not,—know what an injury they are doing to those apprentice boys? Do they wish the ranks of the East London cabinet-makers to be filled with uninstructed workmen who can only do the one or two things that they have learned in their shop? Perhaps this paper may lead to a discussion that will throw some light upon this aspect of the question. The various trade organisations insist, and rightly insist, on the importance of regulations that will keep incompetent and untrained men from creeping into their ranks by indirect ways; might they not equally rightly insist on regulations that will preserve themselves from the incompetent men who necessarily grow up within their own ranks as the result of neglected and uninstructed apprenticeship?

The Future Organisation of Technical Instruction.

Another most important question arising out of the consideration of the present position of technical instruction is the form to be given to its future organisation. It has become a question of national, one may say of imperial, importance; and it should be treated on no narrower a basis of consideration. So far, the only parts of the educational system in Great Britain that can be considered as organised on a national basis, are the elementary schools and a few normal schools under the Department of Education, and the classes in Science and Art, including the Normal School of Science and the National Art School at South Kensington Museum, under the Department of Science and Art. It is true that the three Welsh University Colleges are nominally under the Education Department; but practically, the so-called Education Department is a department of primary education only. It is also true that the University of London is nominally under Government, and nominally draws some 13,000*l.* annually from the Treasury; practically, it receives only about 2,000*l.*, and is self-managed. Beyond this, there is no national organisation of education. To complete anything like a national organisation, the following additional departments need to be organised: A Department of Secondary Education, including under its operations three classes of schools or colleges, namely (1) Higher Literary, or Grammar Schools; (2) Technical Schools and Colleges; (3) Schools of Commerce; A Department of Higher Education, including under its supervision (1) Normal Schools for Training Teachers; (2) University Colleges of the modern type; (3) the several Universities of Great Britain.

It will be seen that in the above classification, Technical Schools and Colleges have been placed along with the Grammar Schools and the future Schools of Commerce in a Department of Secondary Education. The Schools of Commerce do not yet exist; the Grammar Schools,—and under that term are included here not only the few higher middle-class schools, but the great so-called public schools of England, frequented almost exclusively by the sons of the rich,—are for the most part maintained upon old endowments originally intended for the poor. At present they stand in no relation whatever to our primary schools. Fancy a system of scholarships to take capable poor boys from the Board Schools of London to the great secondary schools of Eton or Harrow! Yet it ought to be the recognised course to the University from the primary through the secondary school. Think of the dislocation in our national systems of education that is involved in the fact that not one per cent. of the masters of our public elementary schools, probably not one per cent. of even the head-masters of our public elementary schools, have been trained even for so short a period as one year in any of our Universities. The organisation of secondary education is a matter of absolutely vital importance in this country, but one of which, in the clamour of party politics, scarcely a syllable is heard. The proper co-ordination and maintenance of the local university colleges, though of more pressing moment, is a minor matter compared with the task of organising secondary education.

But the immediate question before us is:—What is the best form to give to the national organisation of technical instruction? At present there appear to be three claimants to the honour of directing the future organisation. 1. The City and Guilds of London Institute, who have a claim by virtue of being, as it were, in possession of the field, by virtue of the large sums which they have expended upon the promotion of technical instruction, and by virtue of the fact that they have already, in their scheme of technological examinations, the germs of a national organisation. 2. The National Society for the Promotion of Technical Education, a body recently formed under the presidency of the Right Hon. the Marquis of Hartington. The claims of this body cannot be based upon anything that it has yet done, or upon the intimate knowledge of the subject possessed by its members, who are mostly eminent politicians. It is, nevertheless, a very powerful body; and its appearance upon the scene at this juncture should be considered as an important factor. 3. The Department of Science and Art situated at South Kensington.

The City and Guilds of London Institute has during the decade of its existence accomplished so much that its claims to be left in charge of the organisation are very strong; they would be stronger still if it were clear that its resources, great as they are, and generously as they have been provided, were adequate to the permanent maintenance of the immense work now begun. The maintenance of the work it has undertaken will soon overtax its present means. Supposing that no increase is made in the grants to the Central Institution, and to the Finsbury Technical College, still the Technological Examinations must be maintained. Last year they cost over 4,000*l.*, this year nearly 5,000*l.*, next year it will be 6,000*l.* In the meantime the available funds are decreasing. The Grocers' Company, which contributed 2,000*l.* per annum, now contributes only 1,000*l.* The Corporation of the City of London, which formerly contributed 2,000*l.* per annum, last year gave only 1,000*l.*, and has not yet sent any contribution for the year 1887. Under these circumstances,—unless, as can scarcely be expected, the generous contributors are prepared to capitalise their grants, it can hardly be said that the permanence of their organisation, even on its present scale, has been secured. It is not for me to suggest the ways and means, but it seems to me that an organisation that has shown such splendid promise should not be lightly thrust aside from taking charge of the work it has begun.

A powerful bid for the future management of technical instruction was made by the Department of Science and Art during the last session of Parliament, in the introduction of the abandoned Technical Instruction Bill. To understand aright the real importance of this move, a little knowledge of the operation of the Science and Art Department is requisite. It is notorious to all who have had anything to do with the South Kensington organisation, whether as students or teachers, how completely stereotyped are all the methods and ideas of that Department. Their training in art appears to be based upon the assumption that all originality must be ground out of the student by putting all students through the same mill. In science their assumption appears to be that any man who has passed an examination in a subject is fit to teach that subject; and that every graduate of an English university is fit to teach every subject in the whole round of the sciences. (See the Regulations in the Official Directory of the Department of Science and Art, July 1887, p. 31, Article 10.) They draw up a syllabus of twenty-five subjects called "Science Subjects," and refuse to recognise even the existence of any science teaching that does not fit to their artificial classification. Optics is not a science unless taught along with heat and acoustics. Heat is not a science unless taught along with optics and acoustics. Teaching about the steam engine is science; but teaching about the gas engine or the electric motor is not! There is a Government grant for teaching the one; there is nothing for teaching the others. The subjects must be taught in a cut-and-dried fashion on the syllabus prepared by the officials, quite irrespective of local industrial applications. Everything seems to be done that could well be done to prevent able and independent instructors from earning grants upon the successes of the best pupils, and to encourage the success of the mediocre "science teacher" in cramming mediocrities of his school for examination in a host of miscellaneous sciences. Cases have come under my personal knowledge that illustrate the system. In one, a most accomplished English chemist, trained during several years in the best laboratories in this country and in Germany, was disallowed from earning, on his successes as a teacher, grants which would have been allowed without hesitation had he been either a Master of Arts of Oxford, a Bachelor of Theology of Durham, or even the holder of a South Kensington Certificate in Chemistry. In another case, an accomplished engineer and draughtsman, who had served his time in the great firm of Maudslay, and who had occupied every post in engineering works up to manager, was disallowed as a teacher of machine construction and drawing because he had never passed the South Kensington examination, whilst at the same time any Board School teacher who had passed that examination was recognised as competent to teach, though he might never have been inside an engineer's drawing office in his life! Nor are the absurdities in the treatment of art less patent. A single example will suffice. At the recent exhibition in South Kensington Museum of the works which had won prizes in national competition, there were shown some wood-carvings executed

in the Young Men's Christian Polytechnic Classes. They were not great works of art; there was nothing really original in the design or treatment; they appeared to be ordinary subjects, perhaps a little stiffly copied, but still very creditable works. It was a pleasure to see them there, and to note that they had been awarded a medal. It looked like a new departure in South Kensington ways to see wood-carving recognised as an art, and encouraged. But this was not at all the official view. The state of official art may be judged when it is known that the medal awarded to these was not awarded to them as wood-carving at all, but simply as if they had been so much raised ornament in clay! There is the level to which the official mind can rise: raised ornament must be judged simply as a pattern, apart from the material in which it is to be executed, apart from all technical excellence. This is the very degradation of art. It is the divorce of the artist from the workman, the very thing that true technical education deplores and seeks to remedy.

Nevertheless this body, which does not understand the first principles of technical instruction, which does not comprehend that the adaptation of the teaching to the local wants, and that the adaptation of the design to the material, are things of the very essence of technical instruction, is the body to which the abandoned Technical Instruction Bill proposed to hand over the national organisation of technical education! According to this Bill, this incompetent body was to be allowed to levy rates for the purpose of teaching to the most bookish of the scholars in our elementary schools its five-and-twenty specific science subjects, or anything else that it might choose to prescribe for the time being; and the term Technical Instruction was to be defined to mean "instruction in the branches of science and art with respect to which grants are for the time being made by the Science and Art Department, or in any other subject which may, for the time being, be sanctioned by the Department." The friends of the technical education movement may, indeed, congratulate themselves that this amazing bill was withdrawn before it reached Committee.

What, then, must be done for the national organisation of technical instruction? In the writer's opinion the first and most important point of all is to secure the creation of a real Education Department under a real Minister of Education. At present we have no Minister of Education, only a Vice-President of Council, whose duties appear to be extensive and peculiar. They comprise apparently the work of looking after the regulations for statute fairs and diseases of cattle, of supervising the Elementary Education Department and the Science and Art Department, and of superintending the proceedings of the Judicial Committee of the Privy Council. What is wanted is a real Minister of Education, presiding over an organisation in which the Elementary Education Department, the Science and Art Department, and the Departments of Secondary (including Technical) and Higher Education, should all take their appropriate places under officials responsible directly to the Minister himself, and not to that mysterious body "My Lords of Council." No attempt by Parliament to organise technical instruction can be satisfactory unless it involves the appointment of a responsible Minister of Education, and a reconstruction of the whole Departmental machinery.

The "Empire Palace," Leicester-square. We are informed that Messrs. Campbell, Smith, & Co., of Newman-street, who decorated the Lyceum Theatre, have been entrusted with the whole of the decorative work at the "Empire Palace," Leicester-square, which is being done under the superintendence of Messrs. Romaine-Walker & Tanner, architects, who designed the decoration of the Gaiety Theatre about a year ago.

A New German Canal.—In addition to the North Sea, Baltic, and the Oder-Spree Canals, now in course of construction in Germany, a plan is under the consideration of the Governments of Prussia and Lubeck for a canal between the rivers Elbe and Trave, whereby the city of Lubeck is to be placed in direct communication by water with the interior of Germany. The estimates and designs for this canal have already been prepared, and the work will, no doubt, shortly be taken in hand.

THE ARCHITECTURAL ASSOCIATION'S "SKETCHING CLUB" SCHEME.*

"Our Sketching Club Scheme" is an organisation for assisting architecture students in their sketching tours. The method proposed to be adopted is a complete system of advisers and local representatives which, for lack of better names, we had called consuls and vice-consuls, the titles used for similar officials in the Cyclist Touring Club, an important organisation to which we are indebted for the first suggestions of our scheme. I may remark that we are not at all satisfied with the title of our scheme, and that some of the gentlemen who have kindly undertaken to help us strongly object to being called "consuls." We should, therefore, be greatly obliged if any gentlemen can suggest better terms for both. The object of my paper to-night is to call attention to the movement and raise a discussion on the question of the desirability of the Association taking the matter up and making it one of its recognised methods of advancing the architectural education of its members, and in the event of this being agreed to, I would suggest the formation of a committee in order to carry on the work. And now I will endeavour to explain our scheme.

It is suggested to divide the whole of the United Kingdom into districts, following as much as possible the county boundaries, but in the case of the larger counties, of course, these have again to be divided. A consul will be appointed for each of these divisions, and up to the present we have succeeded in filling up twenty-seven of these, leaving twenty-five divisions to be filled up. We are in communication with several gentlemen about these places, but we make an urgent appeal to all those who sympathise with the movement to help us to fill up these vacancies as soon as possible. We have only succeeded in appointing ten vice-consuls up to the present, and we are particularly anxious to appoint as many of these as possible, as on them will fall the chief portion of the work, and certainly, from a student's point of view, the greatest benefit. It should, I think, be a great inducement for a student to feel that he was not only benefiting himself in his studies, but at the same time taking part in a work of permanent value, for if our scheme succeeds we hope that it will have the effect of recording in more permanent form than the perishing materials of which the actual buildings consist the architecture of our country. I think we might speedily succeed in interesting the clergy of England and Wales in our scheme. As a rule, they have a great interest in architecture, and from their position in the country they are able to afford valuable information, and often get permission to visit buildings to which the public are not admitted. The exact boundaries of the divisions cannot be defined until the appointments are made, as it is obvious that it is of vital importance to our scheme that the consul should have an intimate acquaintance with his district. We do not consider it a *sine quâ non* that the consuls should reside in their divisions, and in England and Wales we have endeavoured to enlist the sympathy and assistance of the Diocesan Surveyors, and have succeeded in obtaining the consent, as will be seen, of several of these gentlemen to act as consuls. The following is a list of the divisions and the appointments made, and vacancies that have to be filled up:—

I.—*Northern Division.*

1. Northumberland.
2. Cumberland.
3. Durham—C. Hodgson Fowler, M.A., F.S.A., F.R.I.B.A., The College, Durham.
4. Mid York—G. H. Fowler Jones, 8, Lendal, York.
5. East York—John Bilson, A.R.I.B.A., 23, Parliament-street, Hull.
6. West York—J. D. Webster, F.R.I.B.A., 21, Church-street, Sheffield.
7. Lancashire—R. Knill Freeman, F.R.I.B.A., Bolton-le-Moors, Lancashire.

II.—*Northern Central Division.*

8. Cheshire—T. M. Lockwood, F.R.I.B.A., Chester.
9. Derbyshire—F. J. Robinson, F.R.I.B.A., Strand Chambers, Derby.
10. Nottingham.
11. Lincoln—James Fowler, J.P., F.R.I.B.A., Louth, Lincolnshire.
12. North Northampton and Rutlandshire—J. A. Gotch, F.R.I.B.A., Kettering.
13. Staffordshire—C. Lynam, F.R.I.B.A., Stoke-on-Trent.
14. Shropshire.
15. Leicester.

III.—*Eastern Division.*

16. Norfolk—E. P. Willins, A.R.I.B.A., 6, Bank Plain, Norwich.
17. Suffolk.
18. Cambridge—W. M. Fawcett, M.A., F.R.I.B.A., 1, Silver-street, Cambridge.
19. Essex—Fred. Chancellor, F.R.I.B.A., 20, Finsbury-circus, E.C.
20. Huntingdonshire and Bedfordshire.
21. Hertford.
22. Middlesex.

IV.—*Southern Central Division.*

23. Warwickshire — F. B. Osborne, F.R.I.B.A., 13, Bennett's Hill, Birmingham.
24. Worcestershire—Aston Webb, F.R.I.B.A., 19, Queen Anne's-gate, S.W.
25. Herefordshire and Monmouthshire—E. Seward, A.R.I.B.A., Cardiff, South Wales.
26. South Northamptonshire—W. T. Brown, A.R.I.B.A., Wellingborough.
27. Buckinghamshire.
28. Oxfordshire—T. G. Bruton, F.S.A., F.R.I.B.A., 17, New Inn-street, Oxford.

V.—*Southern Division.*

29. Gloucestershire.
30. West Kent—E. J. Bennett, A.R.I.B.A., 5, Harmer-street, Gravesend.
31. East Kent—H. Benstead, F.R.I.B.A., 86, Week-street, Maidsrone.
32. Surrey—E. Locke, St. Michael's House, Basinghall-street, E.C.
33. Sussex — L. W. Ridge, F.R.I.B.A., 7, Upper Woburn-place, W.C.
34. West Hampshire—C. R. Pink, Castle Hill, Winchester.
35. East Hampshire.
36. Wiltshire—C. E. Ponting, Lockeridge, Marlborough.
37. Berkshire.
38. North Somerset.
39. South Somerset.
40. Dorsetshire.
41. North Devon.
42. South Devon—E. A. Appleton, F.R.I.B.A., Torquay, Devon.

VI.—*Welsh Division.*

43. Flint, Denbigh, Carnarvon, Anglesey—A. Baker, 14, Warwick-gardens, Kensington, W.
44. Pembroke, Cardiganshire, Carmarthenshire—D. E. Thomas, Haverfordwest.

VII.—*Scottish Division.*

45. South-east Scotland.
46. South-west Scotland.
47. East-central Scotland.
48. West-central Scotland.
49. Northern Scotland.

VIII.—*Irish Division.*

50. East Ireland—J. L. Robinson, A.R.H.A., 198, Great Brunswick-street, Dublin.
51. South Ireland.
52. West Ireland.
53. North Ireland.

List of Vice-Consuls.

6. West York—G. F. Terry, Buckingham Chambers, St. James-street, Sheffield.
11. Lincoln—R. Fowler, Louth, Lincolnshire.
14. Shropshire—W. A. Webb Somerville, Wellington, Salop; J. F. Fogerty, Priors Lee Hall, near Shifnal, Shropshire.
22. Essex—J. W. Lee, North-street, Colchester; H. Saul, Dover House, Fairlop-road, Leytonstone.
29. Gloucestershire—G. W. Sadler, jun., 6, Clarence Parade, Cheltenham.
33. Sussex: Eastbourne Division—N. C. Nisbett, A.R.I.B.A., 20, Oakley-square, W.
36. Wiltshire—C. Adye, Bradford-on-Avon.
42. South Devon—H. E. Mallet, 11, Burton-crescent, W.C.
44. Merioneth, &c.—Telfer Smith, Rhayader, Radnorshire.
46. Carmarthenshire—H. H. Moses, 55, Lower Cathedral-road, Cardiff.

With regard to the vice-consuls we are anxious to nominate as many for each division as will come forward. If possible they should be resident in their respective divisions, although a vice-consul living in London who had an intimate acquaintance with some locality in the provinces could render great assistance in connexion with the central register.

The duties of a consul are chiefly to receive reports of the vice-consuls and check the information supplied by them, and supply information to students who intend making sketching tours in his division. It will be obvious that everything depends on the accuracy of the information registered, and we cannot expect all the vice-consuls to be equally qualified to make a good report on the buildings in his district. After this information has been checked and corrected, one of the vice-consuls, whose duty it will be to keep the register for the division under the superintendence of the consul, will enter the matter in the register and send a duplicate to the central office in London, where copies of all the reports will be filed. The form of the report should, I think, be based on the excellent examples to be found in Mr. E. Sharpe's book on the "Architectural Excursions in Lincolnshire," and to this might be added references to books which contain descriptions or illustrations of the building, a note whether the building has been measured, and, if it has been measured and not illustrated, a reference to the place where the drawing can be seen if possible. We have specially in view, as a first step, the indexing of what has been done in the way of illustrating

* A paper read by Mr. H. D. Appleton, F.R.I.B.A., at the meeting of the Association on the 18th inst., as elsewhere mentioned.

interesting buildings. Many of the best illustrations are in recent publications, such as our A.A. Sketch Book and other similar books. The professional press contains a wonderful collection of illustrations of old work, and the Transactions of other societies must be carefully searched for information. The work of keeping this index posted up to date with the vast number of publications will be a great work of itself. As the scheme gets into working order, and students avail themselves of it to obtain information, it is to be hoped that they will endeavour to measure up work that has not been previously illustrated, and it should be a point of honour with them to supply copies of their drawings to be deposited in the central office. A small collection of measured drawings exists in the library of the Institute, and some of the drawings which obtain the Architectural Union Company's prize are also deposited in the library. I think, therefore, that, we could not do better than to add to the collection already begun, and I would suggest that, subject to the approval of the Council of the Institute, all the measured drawings obtained through the agency of this scheme should be presented to the Institute library, unless this scheme can be further developed, as I shall endeavour to indicate, and an imperial collection be formed at the Imperial Institute, when our scheme might furnish the section devoted to the United Kingdom. Should this scheme meet with your approval this evening, I hope that I may succeed in enlisting the practical assistance of all present as well as your sympathy, as already an enormous mass of information exists on the subject. One of our past Presidents has favoured me with the following list of books that must be consulted :—

W. Upcott's "Bibliographical Account of the principal Works relating to English Topography," 3 vols., London, 1818, 8vo. This is, of course, an antiquated book now, but the information in it, and in all works containing similar information, should be made use of, as we desire to have, first of all, as far as they can be got at in that way, the facts about each building as already shown by published works.

R. Gough's "British Topography; or, an Historical Account of what has been done for Illustrating the Topographical Antiquities of Great Britain and Ireland," 2 vols., London, 1780, 4to., would thus come into notice also. R. Gough gave his books on British Topography to the Bodleian Library in 1799, and there is a catalogue of them (Oxford, 1814, 4to.).

M. J. Anderson's "Book of British Topography." The index is classified under counties. This is a comparatively new book, but refers only to books in the British Museum.

Mr. E. Sharpe's account of the churches visited in the Lincoln excursions of the Architectural Association, London, 1871, does admirably for a limited number of buildings what we wish to do for the whole of the buildings in the United Kingdom. It will be impossible (probably) to secure that every building shall be examined afresh by a competent person. It ought not, however, to be impossible to give in the great index some account of it after Mr. Sharpe's method.

"Notes on the Churches of Kent," by the late Sir Stephen Glynne, Bart. (London, 1877, 8vo.), is, of course, a very different work from Mr. E. Sharpe's, but it contains the carefully recorded views of a well-intentioned and by no means incompetent person. As edited by Archdeacon Harrison and the Rev. Scott Robertson, both possessed of good local knowledge, it is brought nearly up to date. The visits of Sir Stephen Glynne were in many instances made forty years ago and more. The book might be taken as a starting-point for the county with which it deals, the information in it being thrown into Mr. Sharpe's form or one still more approved. The size of this book may be illustrated thus :—

Mr. Sharpe's book deals with 1 + 13 + 14 + 8 = 36 buildings, and 103 — (say) 25 = 78 pages. are devoted to them, including summaries, appendix, &c., which make up a total of 152 pages in the volume, say two pages in a building. Sir S. Glynne's book deals with 312 churches in 351 pages, that is, 1·12 pages to a building. There are 120 parishes in Herts. Thus there is a piece of steady work cut out for the vice-consuls of a small county, and a fine task for the officers in a big one.

In a few "Hints on the Practical Study of Ecclesiastical Architecture and Antiquities," for the use of the Cambridge Camden Society, 4th edition, 1843, we have a form which was largely used for recording the whole of the features of a building.

In Whewell's "German Churches," 3rd edition, 1842, are some hints on methods of taking notes as to vaulting, and which would also deserve consideration.

The "Ecclesiastical and Architectural Topography of England," published under the sanction of the Central Committee of the Archæological Institute of Great Britain and Ireland (Parkers, 1851), dealt with Oxford, Beds, Huntingdonshire, and Cambridgeshire.

The method is good, and the observers were generally competent. The index of styles and lists of dated examples are good features. Domestic architecture is also brought in, as it, and, indeed, all structures, should be in our scheme.

With regard to unpublished matter, Sir Stephen Glynne had, when he died in 1874, surveyed and put on record his notes as to 5,530 churches. The Kent publication dealt with 312, leaving 5,218 not likely to be published now in any separate form.

Doubtless these papers could be obtained if properly applied for by any one duly empowered.

Mr. E. Sharpe intended to make a complete list, and give an account of the buildings in Sussex, and, I believe, did a large amount of the work (note the list of Mr. Sharpe's publications in the "Charente" Book, published by the Architectural Association in 1853). He visited all the churches in Sussex of ancient date which are worthy of notice, except two (letter of September 4th, 1853). The notes have been preserved. "The Churches of Sussex" was, I think, to have been the title of the book, as Prof. Willis on Chichester, Rev. J. L. Petit on Boxgrove, E. Sharpe on Shoreham; but the part, "The Church Architecture of the County of Sussex," by E. Sharpe, M.A., which would justify the comprehensive title, was never finished, though the publication was delayed for seven years, waiting for it.

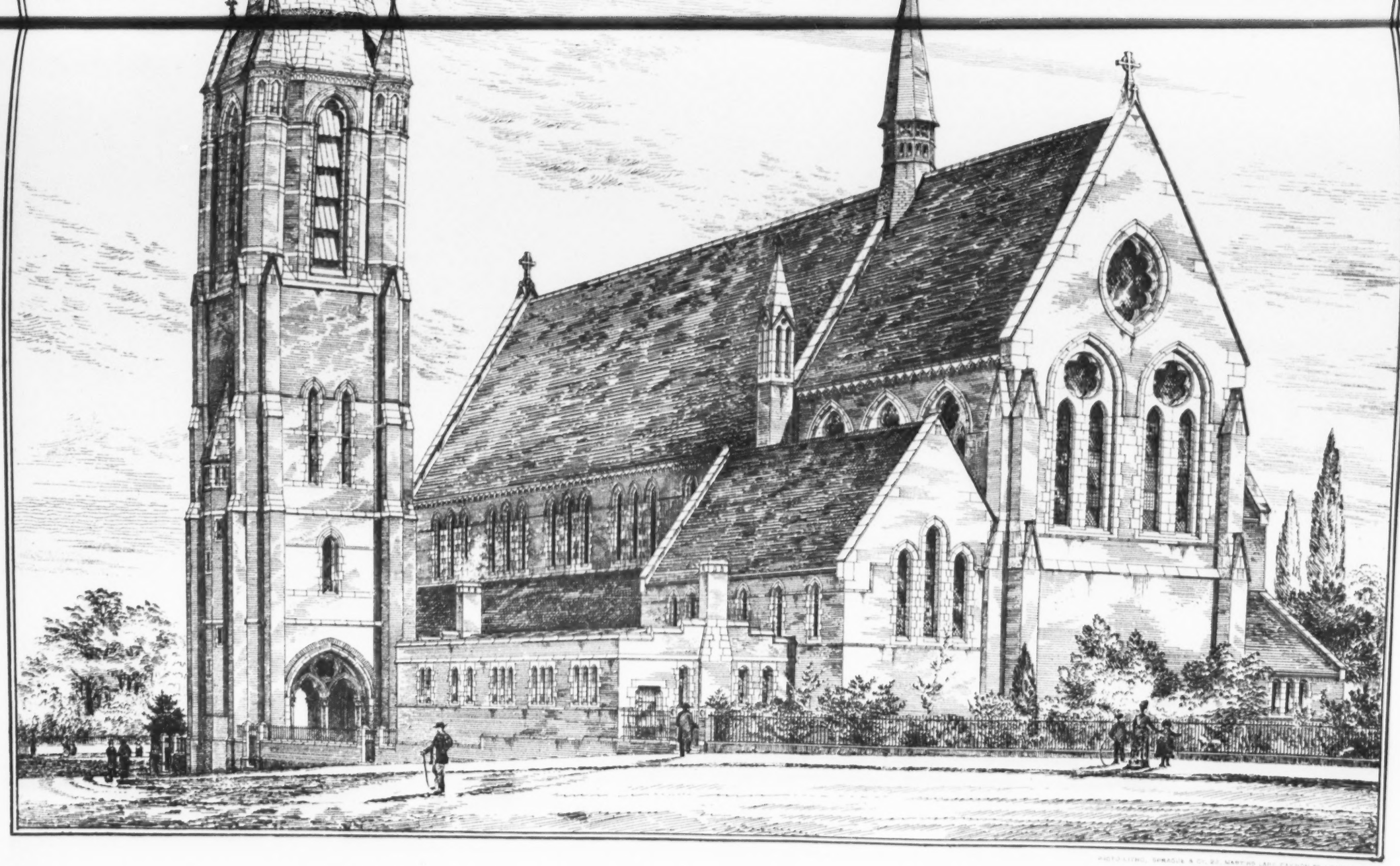
The Ecclesiological Society, no doubt, has a great quantity of information obtained in the name of the Cambridge Camden Society, which has not been published, and, in addition to this, in the portfolios of architects all over the country lie innumerable drawings of interesting buildings; and may I appeal to them to send a post-card to me at 157, Wool Exchange, Coleman-street, E.C., if they are willing to place these at the disposal of our scheme? Practically speaking, the great bulk of this information is utterly lost to the public for want of proper indexing, and the question is, how can we make these dry bones live? I believe that by some such organisation as I have endeavoured to sketch out to-night much of the valuable work done can be made of living interest, and, in course of time, of great historical importance.

Of late years there has been a tendency to substitute sketching for measured drawings, and the result has been the production of much most delightful and interesting work; but for a register of this nature I am of opinion that, while sketchers should not be excluded, efforts should be made to obtain as many measured drawings as possible, and that there is an idea that, perhaps, after all, measuring is a better training than sketching, is, I think, indicated by the fact that the Institute has given the example of Mr. Burges's work as the method to be pursued for the Edis prize. I hope I shall not from this remark be thought to disparage sketching, but for the purposes of a register of the two I think that measured work will have the more permanent interest.

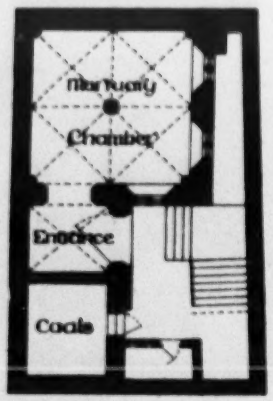
Now, when our scheme has got to work the student who has made up his mind which district he proposes to visit writes to the consul for that division and receives from him a list of the buildings of architectural interest and notes of the books which refer to the particular buildings and the number of buildings that have been already illustrated. The student is thus able to judge at once of the character of the work he is about to study, and to either read up beforehand the historical or antiquarian information that he may wish to acquire to render his studies complete or to take such books with him as will assist him in his investigations. Of course, I do not wish to recommend students to neglect those buildings that have been illustrated as I am quite aware that there are a certain number of buildings which it is almost essential that a student should study to really become efficient in his art, but I am sure that there are many rich examples of architecture that have not been illustrated, and I can fancy the student would naturally be ambitious to venture on pastures new. From my experience, as secretary to the Annual Excursion of the Architectural Association, I know the difficulty there is in finding good and accurate information about the buildings in particular districts. Even when we have had the assistance of the local architects and the accumulated wisdom of the committee it has been the custom for some years past for the secretary to go over the ground before the excursion is arranged, and report on the number of good buildings to be found in the neighbourhood of the headquarters proposed. Now, much of this information the private student is quite unable to obtain, and it is to fulfil this purpose that our scheme was mainly started. To the student properly introduced to the consul special facilities for obtaining permission to visit buildings not usually open to the public might be granted, and generally the vice-consuls would act as guide, philosopher, and friend to the tourist; such necessary information as to board and lodging would also be supplied by the vice-consuls, and, possibly, in course of time, we might arrange tariffs like our prototype the C.T.C. The reason why the former attempts to form a register of buildings in the United Kingdom, as far as I am able to judge, have more or less been failures, seem to me to be on account of the want of youthful vitality in the undertakings, those who started them having, in the inevitable course of events, grown old and passed away, leaving no successors to carry on their work; but we hope to attract to the scheme a constant accession of young blood, so that the work being done by students for students it may, like our Association, always boast of perennial youth and enthusiastic support.

But it is always easy to create an interest in foreign missions, distance lending enchantment to the view; but "why should London wait?"

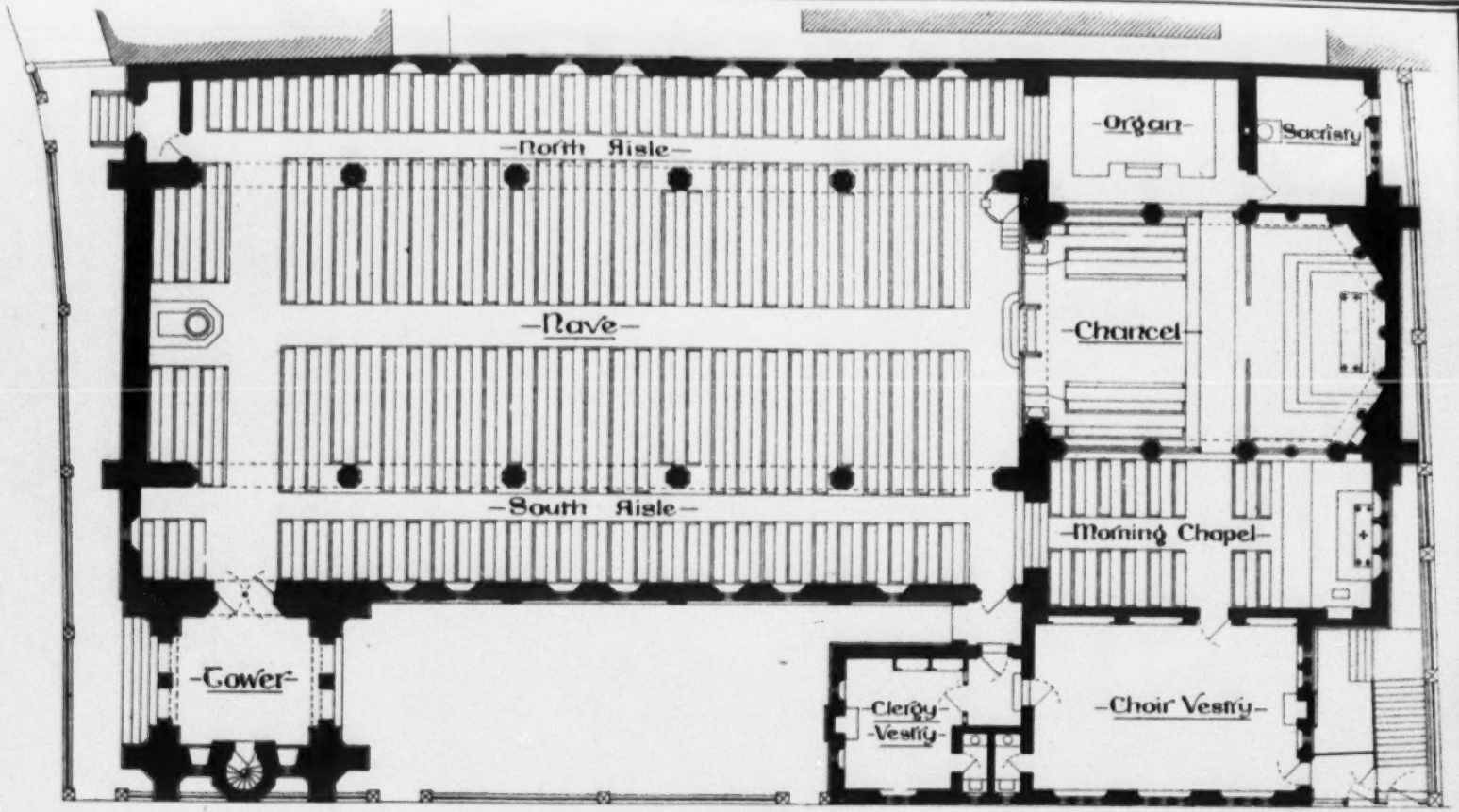
How many of us here to-night could give, say an American architect on a visit, a satisfactory list of the best buildings of architectural interest in London, the names of their architects, and the dates of their erection? It seems to me that there is enough scope in London alone to occupy the attention of a large committee for a considerable period, and how grateful the provincial students would be for carefully-prepared lists of buildings to visit for a holiday in London of fourteen days, and others for longer periods, I cannot say, but both from provincial architects and our American cousins I have had applications for such lists, and I have always regretted that I could only very inadequately supply the information required. A vigorous effort on the part of the London committee would be a splendid example to our country members, and the experience gained in arranging the register of the wonderful collection of buildings of interest to be found in London would be the best method of ascertaining what results could be obtained in the larger undertaking. When it is possible to enlist the co-operation of so many skilled hands, the individual labour need be but small. If each member of our Association living in London would undertake to work up only two buildings, we should have made a good start. Nearly all the London examples have been carefully measured, therefore it would be only necessary to obtain copies of these drawings, and register the other information, and a really splendid result could be obtained. I think also the Vacation visits might co-operate with this scheme. A little organisation similar to the method pursued by the late Mr. E. Sharpe would produce, I am sure, most gratifying results, and there are still among our number a few of the original excursionists who worked under him, and who, I have no doubt, would be willing to instruct the present generation in the way in which they worked in their salad days. The annual excursion in August, too, might also take part in helping forward this work, and the week's excursion would be of great value to the vice-consuls of the district, as we invariably find that the provincial architects are glad to avail themselves of the opportunity of going round with our party, and often confess that they were not aware that so much good work existed in their particular neighbourhood. I have been kindly furnished by Mr. Holden, of Manchester, with a list of the buildings of architectural interest in the neighbourhood of that city, which has been prepared by the Man-



CHURCH OF ST. BARNABAS, TUNBRIDGE WELLS.—Messrs. J. E. K. and J. P. Cutts, Architects.



—Plan of Mortuary—
—under Morning Chapel—



SCALE OF FEET
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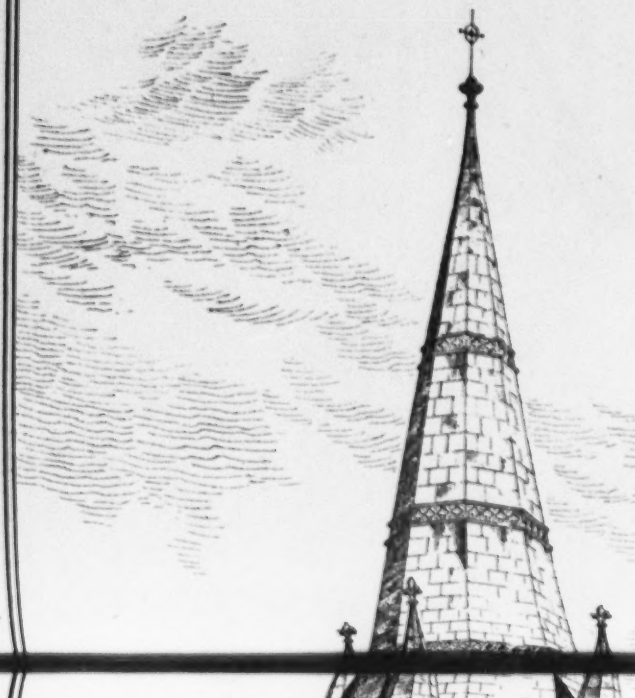


"OLD CHATEAUX OF THE LOW COUNTRIES." (See article on another page.)

PHOTO-LITHO. GRIGGS & C°. 25 MARTINS LANE, CANNON ST. LONDON, E.C.

Arbroath Abbey. South Transept.

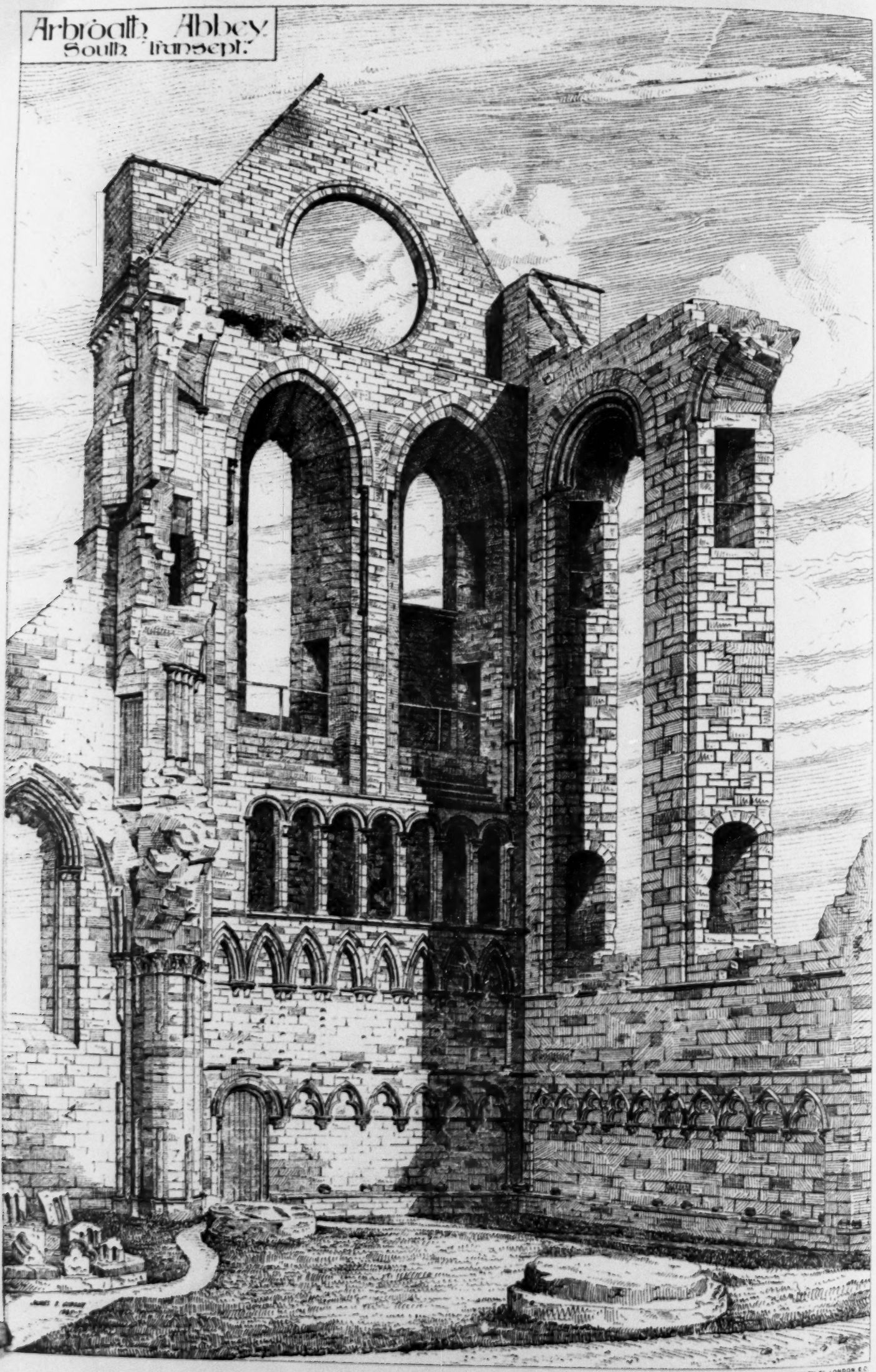
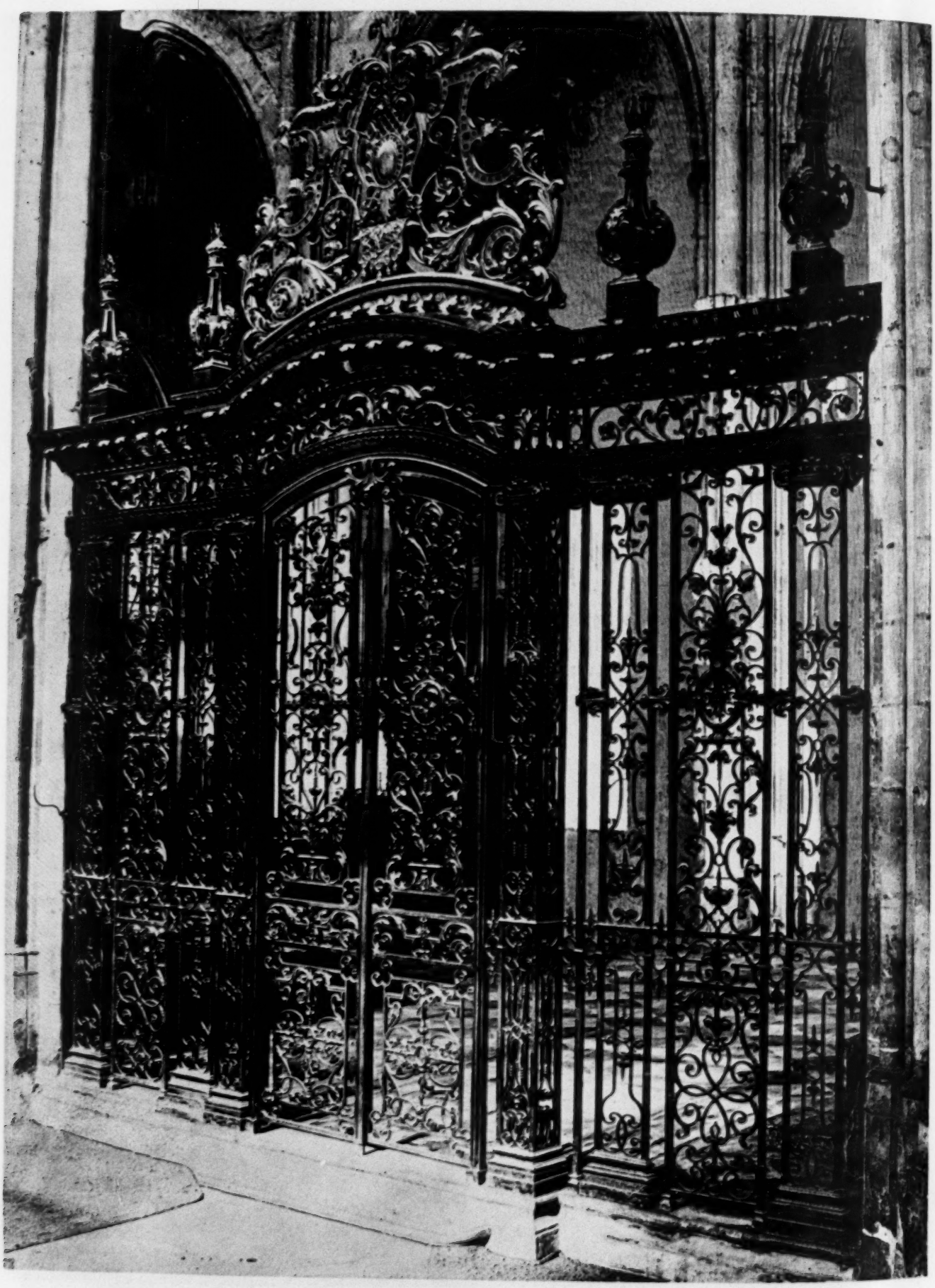
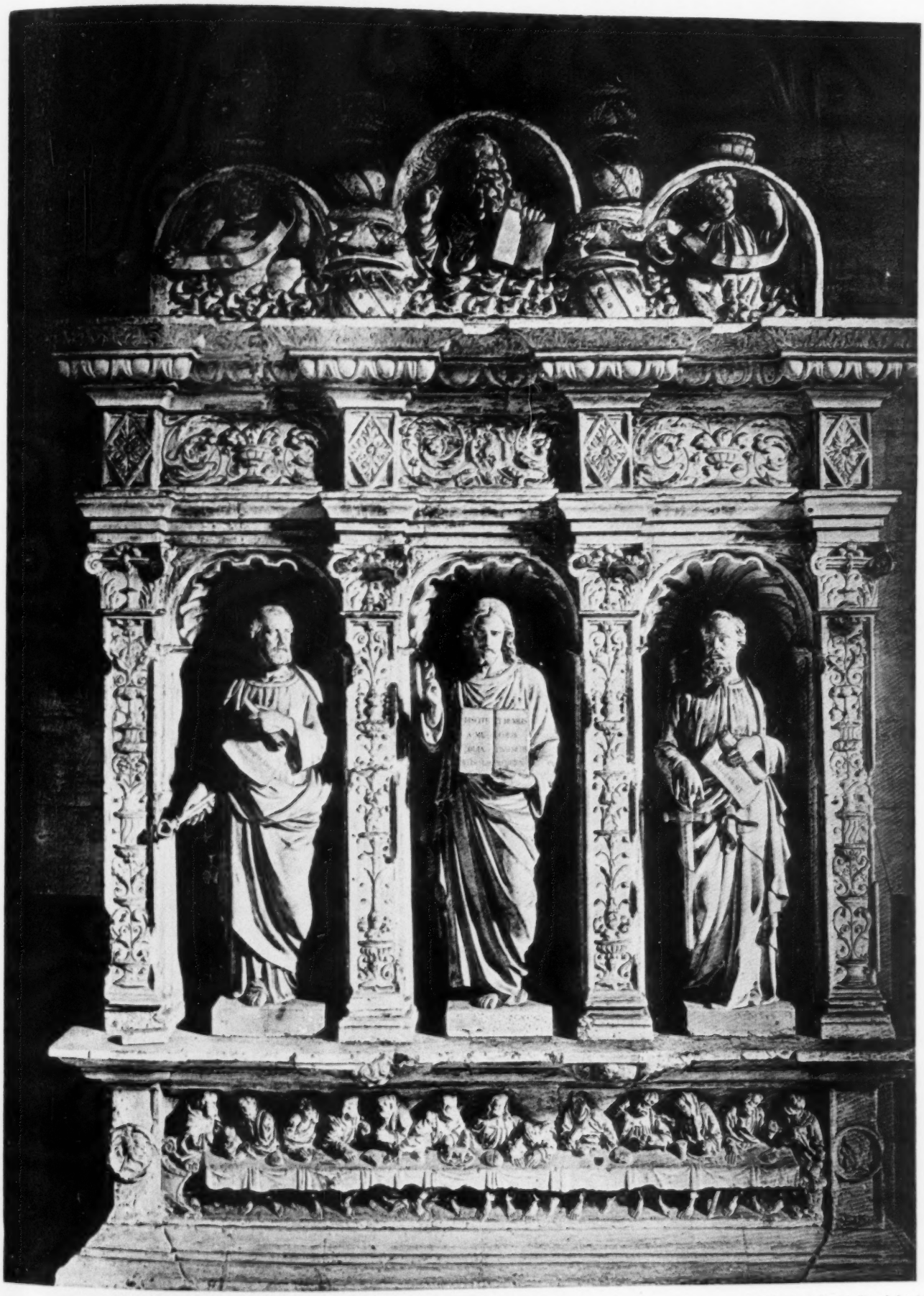


PHOTO-LITHO SPRAGUE & Co., 22, MARTINS LANE, CANNON ST. LONDON E.C.



The Phototype Co., 308, Strand, London

GATES AND GRILLE IN THE CHURCH OF St. OUEN, ROUEN.



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REREDOS IN THE CHURCH OF St. PIERRE, AVIGNON.

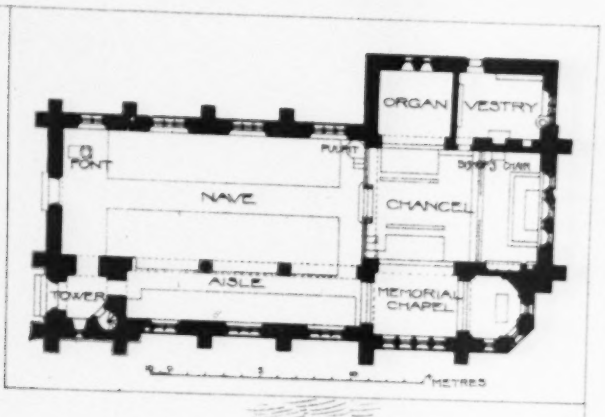


PHOTO-LITHO. SPRAGUE & Co., 4R, MARTINS LANE, CANNON ST. LONDON, E.C.

CHURCH OF ST. GEORGE, CANNES.—Mr. A. W. Blomfield, M.A., Architect.

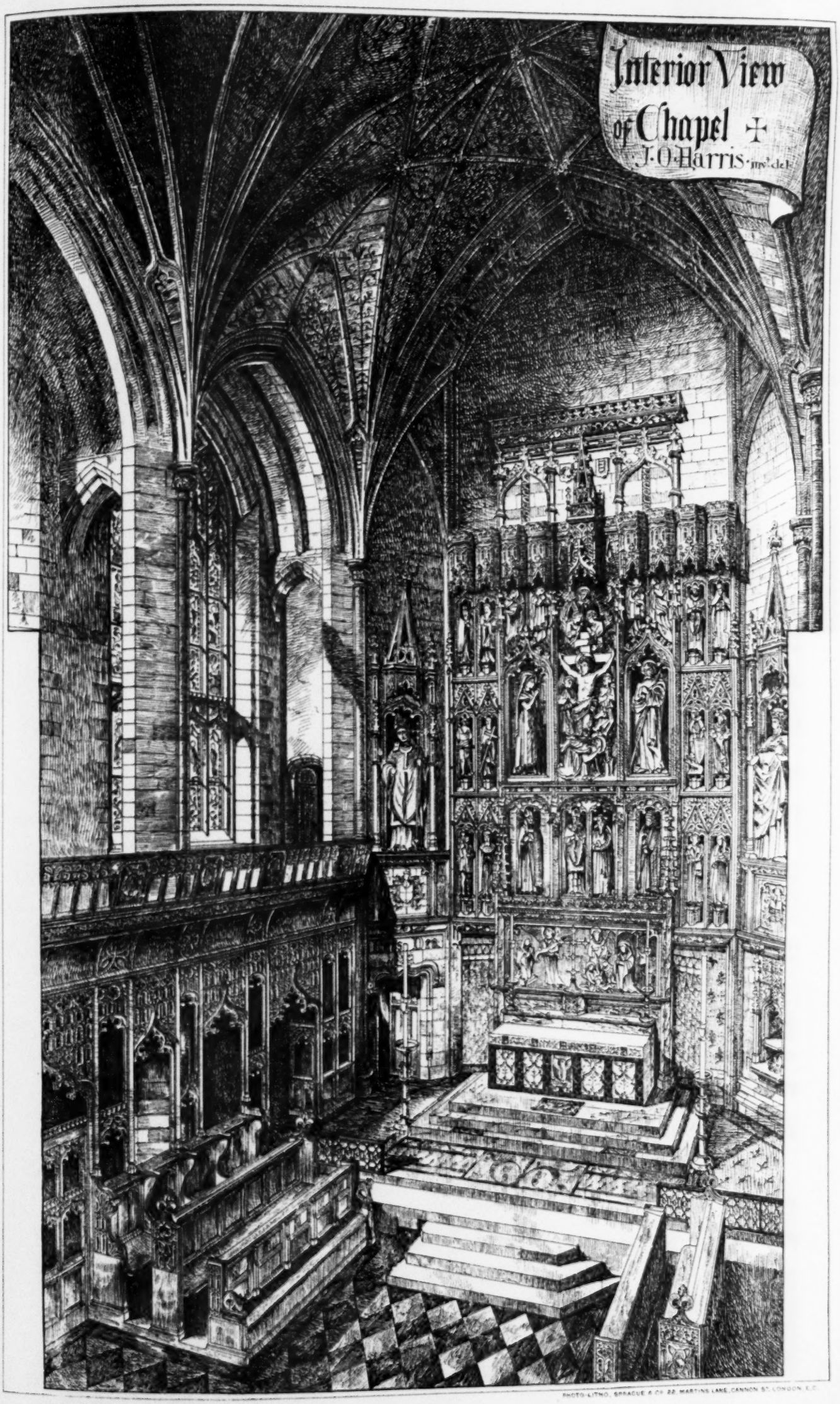


PHOTO-LITHO. BRAGUE & Co. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

chester Architectural Association, and I hope to be able to enlist the co-operation of that association so that they may join in our scheme, and the information that they have already collected be made at once available for our register. I have no doubt that the other architectural societies could easily compile similar lists, and in this way a good start be made in the provinces. The historical side of the scheme would be the collection of well-executed and carefully-authenticated drawings of buildings which the inexorable hand of Time and the equally destructive hand of the restorer are fast removing from the face of the land.

In conversation with an eminent diocesan surveyor the other day, he remarked to me that much of the bad restoration which had been carried out in the early part of the century in Caen stone is suffering as much from decay as the old work, and he prophesied that in a short space of time it will be difficult to distinguish between the restored work and the original work. One of the benefits of our register will therefore be to preserve the reputation of the original work; and had such a record been begun only one hundred years ago, how much might not have been saved that is already lost.

The President of the Royal Institute of British Architects, in his presidential address, remarked that "it had occurred to him that one most fitting work for the Imperial Institute would be the production of a thorough and complete record,—perfect in all its details,—of the more important architectural monuments contained in India, and the many historical sites and ruined cities to be found within the various dependencies of Great Britain and Ireland." This, no doubt, has already been accomplished to a slight extent by private enterprise and liberality, but there is no complete or national work of the kind, and I venture to hope that there may soon be found means by the agency of the new Imperial Institute to furnish the world with at least a catalogue of the historical monuments extant within the confines of the British Empire. I venture to suggest that we might help in this Imperial idea by presenting the materials for the sections devoted to the United Kingdom. I have said that this scheme is for students worked by students, but if we might be allowed to work for an Imperial scheme as well as benefit ourselves, surely it ought to give an additional impulse to the movement. The President of the Institute referred to the fact that, unfortunately, architects as a corporate body had not been able to contribute to the funds of the Imperial Institute for reasons which many of us feel to be most unanswerable; but if silver and gold we have none, we can all help in placing on record the splendid inheritance which our forefathers have left us. The best work of the past was not true for an age, but for all time, and as we know that day by day owing to natural causes this is gradually but surely disappearing, what more gracious part could we play than to endeavour to stay Time's devouring hand and record what is left of our glorious heritage? The collection of such a register as Mr. I'Anson foreshadowed would be almost the complete architectural history of all time, and I can imagine no prouder position for the Association to occupy than to do its humble part in helping forward so monumental a work. What splendid material it would furnish for the future historian of our noble art! Again, the value to our colonists of a complete record of all the architectural buildings in the United Kingdom would be almost greater than to ourselves. We are so accustomed to be surrounded by these relics of old times that, to a certain extent, we fail to appreciate them; but to those who come from new countries the opportunity of studying these works of art and comparing them in one collection would, I fancy, stimulate their enthusiasm, and they would with little trouble be able to concentrate their study of the actual buildings in the short space of time most of them have for such work, and to select those examples which best illustrate the particular branch of the art they are interested in.

The value of some such collection is so obvious that surely an appeal has only to be made to the Council of the Imperial Institute for it to be warmly taken up, and I would suggest that as soon as our scheme had succeeded in making some substantial progress, which could be done in a very short space of time, we should offer to place the information it had collected at the disposal of the Imperial Institute as a foundation for the larger scheme, and that we should push on our own work as vigorously as possible, so as to create a good precedent for the other portions of the empire to take example by. Gentlemen, I simply suggest this ambitious view of my subject, in its ultimate development, for your consideration, but I hope that, should it not meet with your approval, it will not prejudice the simpler scheme out of which it has grown. The value of the great index of buildings of architectural interest is hard to exaggerate, and this could be compiled without the illustrations which I suggested for the larger scheme; but I venture to think that the collection, preservation, and systematic arrangement of carefully-measured drawings of old buildings is well worthy of the consideration of the Architectural Association as affording facilities for the study of civil architecture, —the leading object of the Association as set forth in the rules,—and, therefore, Sir, with your permission, I will conclude by proposing "That the Sketching Club scheme be adopted as one of the recognised methods of the Architectural Association, and that the Committee be asked to appoint a sub-committee to carry on the work."

[Of the discussion which followed we give a report on another page.]

Illustrations.

REREDOS, ST. PIERRE, AVIGNON.

ST. PIERRE D'AVIGNON is a "Monument Historique," and the most interesting of the buildings in the town after the cathedral and the Palace of the Popes. The church is said to have been founded in 433; it was, however, entirely rebuilt in 1358, and the west front, which is usually considered a *chef d'œuvre*, dates only from 1512. The reredos that we illustrate, with the exception of the three full-length figures, which are evidently modern, seems to be of about the same age. The church possesses a pulpit, noted for its exceptional beauty, and some good pictures.

GATE AND GRILLE, ST. OUEN, ROUEN.

THE Abbey Church of St. Ouen has sustained less damage than might have been expected, seeing that it has been twice desecrated by iconoclasts. Not only did the Revolutionists of the First Republic turn the church into an armourer's shop and erect a forge in it, but in 1562 the Huguenots made three bonfires in the building for the purpose of destroying the stalls, pulpit, organ, and priests' robes. Among other damage done at this time, the rich screens of gilt bronze in the arches surrounding the choir were destroyed. Some of the arches seem to have been subsequently built up, for it is recorded that "in 1743 the monks caused the five arches surrounding the sanctuary to be opened out for the purpose of placing in them iron grilles enriched with gilt ornaments."

The screen represented in our illustration is doubtless one of those erected at that time; it stands in the easternmost bay of the south arcade, next to the three which form the apse.

ST. BARNABAS CHURCH, TUNBRIDGE WELLS.

A CONSIDERABLE amount of the work of this church has been buried underground, as, unfortunately, the only site available was on an old filled-up stone quarry; consequently the foundations had to be carried down 24 ft. through the loose filling in to get to the solid rock. The church is being built of red brick, with pillars, arches, and dressings throughout of local stone, a very large amount of which is being used in the building. The chancel arcade arches are filled in with stone tracery. The roofs are to be of the best Crown Memel fir, which has been specially imported for this work. In the basement there is a groined mortuary. The doors and seats are to be English oak; carving will be liberally used. The work was commenced last September, and it is expected that it will be completed before the end of next year. The total cost of the building complete, with fittings, will be about 17,000*l*. Mr. Thomas Williams, of London, is the builder, and the church is being built from the designs and under the superintendence of Messrs. J. E. K. and J. P. Cutts, architects.

ARBROATH ABBEY.

THE remains of this interesting structure are situated near the centre of the town of Arbroath, in the county of Forfar. The abbey was founded in 1178 by William the Lion, and dedicated to St. Thomas à Becket, who was slaughtered at the high altar of Canterbury Cathedral in 1170, and canonised in 1173.

It has been the subject of much speculation why a Scottish king should dedicate one of the finest of our abbeys to an English saint; but as far as I am aware, no satisfactory explanation has been found. The Norman barons also contributed generously towards the endowment of the abbey, and in 1204 King John granted a charter of privileges to the abbot, monks, and citizens of Arbroath, "to buy and sell their proper goods, through our whole territories (England) with the exception of London, freely and without molestation."

The abbey was completed and consecrated in 1233, and was one of the richest and most magnificent in Scotland.

The drawing illustrates the south transept, known as St. Catherine's Chapel or altar, and shows the building as it now appears. The details are very delicate and beautiful, and many interesting peculiarities are to be found throughout the buildings. The stone used is of a dark red colour, which weathers fairly well, but the building has been subjected to a lot of bad usage.

The abbey possessed some famous men as abbots, amongst them being Gavin Douglas, the translator of Virgil. At the Reformation its wealth was converted into a temporal lordship, and in the seventeenth century the greater part came into the hands of the Panmure family, whose present representative is the Earl of Dalhousie. J. S. G.

ST. GEORGE'S (ALBANY MEMORIAL) CHURCH, CANNES.

WE give an illustration of this church, which was built from the designs of Mr. A. W. Blomfield as a memorial to the late Duke of Albany.

We gave full particulars in regard to the church in the *Builder* of January 22nd and February 19th of this year (pages 165 and 304, of our last volume).

DESIGN FOR A CHAPEL.

THIS design is by Mr. J. O. Harris, who gained the Soane Medallion in 1884 for a Design for a Theological College. The design now published was made with the idea of representing the interior of the chapel of such a college.

The drawing from which it is taken was in the Royal Academy exhibition.

FIFTY YEARS' PROGRESS IN ENGINEERING.

THE INSTITUTION OF CIVIL ENGINEERS.

THE President of the Institution of Civil Engineers, Mr. G. B. Bruce, in the course of his recent opening address, said that having entered upon his apprenticeship in the locomotive works of Robert Stephenson within a few months of the beginning of the present reign, he chose the state of Engineering then, and in the Queen's Jubilee year, as the subject of his remarks. Starting with the workshop, in 1837 machine-tools were practically unknown, reliance being placed upon the skill of the workmen, who could chip and file by hand almost as truly as the machine. It was scarcely credible, but it was a fact, that there was not a single crane in Robert Stephenson's shops in 1837, and the only steam-engine in that which was the most important locomotive shop in the world of that day was a vibrating pillar-engine, with a single 16 in. cylinder and 3 ft. stroke. About the only machine-tool, properly so-called, in the works was a planing-machine, which probably weighed about three tons. At the present time there were lathes 75 ft. long, weighing 100 tons, giving a yield of steel-turnings at the rate of 10 and 20 tons a-day, and planing-machines weighing 90 tons and operating over surfaces of 20 ft. by 15 ft. Referring to the changes in the position of the workman, in 1837 the wages of an engine-erector in Newcastle were 23s. per week, working sixty-one hours; in 1887 the wages were 32s. per week, working fifty-four hours.

The increase in money earned was 39 per cent., and the rise in rate of pay per hour (from 4·52d. to 7·10d.) was 57 per cent. Taking into consideration that the prices of nearly all the necessaries and the ordinary comforts of life, with the exception of English beef and mutton, were considerably less now than in 1837, it was very clear that the position of the British mechanic had greatly improved during the reign of Queen Victoria, for though he only dealt with one class of workmen, the same circumstances had been at work in favour of them all. Speaking of foreign competition, the President said, "We are constantly told that the difficulty Britain has in holding its own in the markets of the world is due to our want of technical education. There is something in this, but in my judgment very little. The true cause of the difficulty is the large increase in wages and the diminution in hours of labour. It would be pleasant to think that this was not so, but I have not the shadow of a doubt that it is the main cause of the difficulty of meeting foreign competition." Turning from the workmen to the work produced by them, the President contrasted the 9 or 10-ton locomotive of 1837 with the 40-ton engine of to-day, noting also that the bogie truck, which was in the first instance sent out to America from this country, had been now largely adopted in the land of its birth, where for so many years it was not recognised. In the construction of public works great changes had occurred, mainly due to the very extensive introduction of iron and steel instead of masonry, and to the use of Portland cement concrete. These changes had had their greatest development in the case of bridges, the leading dimensions of many of the largest of which were mentioned. The substitution of iron and steel for brick and stone was not, however, in his view, an unmixed advantage. Whatever the cause, the graceful and time-honoured arch had largely given way to a substitute which had neither grace nor beauty about it, and which should therefore be avoided, except where the physical conditions to be obtained could not be secured by the adoption of the arch.* In this respect the President ventured to think that former days were better than to-day, that the use of iron had been carried to an extreme, and that engineers would do well to retrace their steps and not use flat iron girders where a brick or stone arch was admissible. The progress of railways might be briefly told. In 1837, there were 200 miles of public railways open in the United Kingdom; in 1887, there were 19,332 miles open, representing a total capital of 828,354,254*l*. The President dwelt at some length on the great development of iron and steel industries since 1837, the most important changes having been brought about by the inventions of Sir Henry Bessemer and Sir William Siemens, with the important modifications of Messrs. Thomas and Gilchrist, whereby these processes were now available in the case of ores formerly quite unsuitable. The manufacture of iron plates, and, later, of those of mild-steel, had enormously affected the progress of steam-shipping; for, while the tonnage of British steamers in 1837 was only 67,969 tons, it had risen in 1886 to 4,318,153 tons. In the interval the old form of engine had been completely altered, the side-lever type, consuming 6 lb. and upwards of coal per indicated horse-power per hour, giving place successively to the compound, the triple-expansion, and, lately, the quadruple-expansion engine, with a coal consumption about four times less: at the same time the effective speed of Atlantic liners had risen from about 9½ knots to 19 knots. The President next referred to sanitary engineering, in which, during the Queen's reign, the most notable advance had been brought about by the passing of the Public Health Act of 1848. The far-reaching consequences of this Act and its successors might be summed up in the fact that whereas the annual death-rate in England in 1837 was in many cases 30 per 1,000, it was now below 20 per 1,000. In the application of hydraulic machinery to engineering, the progress during fifty years had been very great, especially in the direction of devices for the lifting and handling of goods, formerly entirely effected by human labour. At the present time, by the aid of hydraulic power, it was not uncommon for a steam collier of from 1,200 to 1,800 tons to enter a dock at high-water, discharge her ballast, receive her outward cargo of coal, and leave at high water next day, all being done within twenty-four hours. Amongst the changes which the civil engineer had had a share in effecting during the last fifty years, none had taken so strong a hold on the imagination of the world as the application of electricity to the work and wants of man. The principles concerned were of older knowledge than the past half-century; it was mainly in the practical utilisation of this older knowledge that advance had been made. Reference was made to the electric telegraph, which had developed from the five-needle instrument of Cooke and Wheatstone, employing six wires and working at about the rate of four words a minute, to the system of multiplex and automatic telegraphy, by means of which six messages could be sent at once on one wire, with a speed of, say, 600 words per minute. Touching successively on the telephone, electric-light, and the application of electricity as a motive-power, the President hazarded the opinion that when some way should have been discovered of storing up in a more efficient and financially successful manner the unemployed forces of nature, such as the winds and tides, then would electricity become a factor in the world's life compared with which it was at present as nothing. In conclusion, the President remarked that he had purposely made no reference to instruments of war, whether guns or ships, holding that the progress which spoke of "peace on earth" was more in accord with the sound of "Jubilee" than the development which dealt with munitions of war.

* We are exceedingly glad to find that there is one engineer, at all events, who can see this.—Ed.

THE ARCHITECTURAL ASSOCIATION.

The third meeting of this Association for the present session, was held on the 18th inst., in the meeting-room of the Royal Institute of British Architects, Mr. John Slater, B.A. (President), in the chair.

The following new members were elected, viz., Messrs. S. H. White, A. Huddart, F. W. Dorman, J. S. Stuart, W. W. Kenworthy, E. Thornton, R. I. B. Proctor, F. W. Bedford, F. W. Shenton, H. Tooley, W. J. Roberts, W. B. Clarkson, E. Box, C. T. Lofts, S. B. Silcock, H. Ayling, P. Leeds, and E. P. Howard.

Mr. T. E. Pryce (Hon. Sec.) read a letter from Mr. Freeman, the Secretary of the Architectural Union Company, announcing a donation of twenty guineas to the library fund of the Architectural Association, for the purchase of books.

Mr. W. Burrell (Librarian), in proposing a vote of thanks to the Architectural Union Company, said it was an unsolicited gift, made without any advance on the part of the Association.

Mr. H. W. Pratt seconded the vote.

The Chairman, in putting the motion, said the gift was a most acceptable one, as the number of books, especially in the lending library, was none too great. The resolution was then carried by acclamation.

The Chairman said that for the last few months the Carpenters' Company had been forming a library of works of reference, chiefly connected with carpentry, but including many others connected with building, and also a lending library. He had received a communication from Mr. Banister Fletcher, one of the Wardens of the Carpenters' Company, stating that any member of the Association furnished with a letter of introduction from the Hon. Secs., or with his ticket of membership, would have the advantage of using the reference library, and be able to take home books on paying a deposit of 5s., to be returned when the book was brought back.

Mr. F. R. Farrow (Hon. Sec.) announced that on the 15th inst. a meeting of the cycling members of the Architectural Association was held at 9, Conduit-street, when a resolution was passed to the effect that it was advisable to form a club to be called "The Architectural Association Cycling Club," having for its object the combination of architecture and athletics, by instituting cycle runs to places of architectural interest. It was further resolved that the subscription should be merely nominal. Mr. Herbert D. Appleton had been elected Captain, the Hon. Sec. being Mr. Leonard V. Hunt, 35, Queen Victoria-street, E.C. The meeting stood adjourned until December 5th. Members of the Architectural Association wishing to join the Cycling Club were requested to send their names to the Secretary.

Mr. H. D. Appleton then read a paper entitled "Our Sketching Club Scheme," which we print on another page.

Mr. J. A. Gotch seconded the motion with which Mr. Appleton's paper concluded. To make an index, he said, such as Mr. Appleton had foreshadowed, of all the references that had been made to buildings, was a task at the thought of which many men might quail, though such things, of course, could be done by the exercise of time and patience. On the other hand, the first aspect of the question, viz., the keeping of a list of buildings, would seem to be quite or nearly feasible. He would have great pleasure in undertaking the consulship, or whatever the post might be termed, of the district in which he resided. He believed that in that particular district it would be possible, first of all, to tabulate all the towns and villages, and then from personal knowledge to put down all the most notable buildings. It would be a difficult task to sift the good information, as many of the books were now out of date, and the illustrations were only of interest from a historical point of view, and as showing how wretchedly people used to draw (laughter). It was also difficult to obtain reliable information even from local architects and parsons. The latter, as a rule, would probably be found to be animated with an ecclesiastical and Gothic feeling, and would know nothing about domestic work, despising, or holding of little account, anything Jacobean. What they had to do, therefore, was to obtain the assistance of men of catholic mind, who would be willing to give information about anything, say from the prehistoric boat discovered at Brigg, down even to post-Reformation work.

Mr. F. T. Baggallay proposed a vote of thanks to Mr. Appleton for his paper. The scheme seemed to be a most excellent one. The ordinary guide-books were nearly worthless for use when on a sketching tour, while such a list of buildings as was now proposed would be most helpful, especially if means were used to indicate the different degrees of importance.

Mr. S. F. Clarkson seconded the vote of thanks to Mr. Appleton.

Mr. F. M. Elgood said he thought that sketching tours might be started in connexion with the Cycling Club now about to be formed by some members of the Association.

Mr. W. Randolph remarked that he would be ready to contribute his quota of information regarding the district with which he was acquainted, viz., South Yorkshire.

Mr. H. W. Pratt suggested that the consuls and vice-consuls should be asked to supply information to head-quarters as soon as possible, so that it might not be necessary for students going to their several districts to trouble them. It would be well, too, if the consuls could in some way furnish information as to how certain buildings could be inspected, and if possible get permission for students and others to measure, sketch, or inspect the buildings. He would also advise that, say once a month, a district should be taken up and the information published in the "*A. A. Notes*." By that means the information would, in course of time, be available for reference, and would save people going even to head-quarters for it. The great indexing scheme would doubtless furnish work for several generations, and was rather an appalling task to talk about, let alone to commence upon, besides which much of the information got by the expenditure of considerable labour would not be of much value. He would, therefore, rather see an index attempted comprising fewer publications, but which might be the nucleus of a larger one. He was glad that stress had been laid upon the fact that the Architectural Association was the body best fitted to deal with such a task, because it was only young men who could give time to measuring work. When they got older and were engaged in practice they would have little time for such work; therefore it was most desirable that those who were in their articles should devote their time in measuring.

Mr. F. R. Farrow said he believed it would be necessary to centralise the information obtained, so that members could learn what they desired without troubling the consuls.

Mr. T. E. Pryce thought that active parties of cyclists might very well fish out a great deal of information which might be sent to head-quarters without troubling the consuls. He would like to see the scheme carried out in its integrity, but it was a difficult matter to draw the line as to what were the important

buildings in a particular locality. In a weak moment, a few years ago, he undertook to do something of the same kind for a local society, but he found, to his astonishment, that there was work for a long life-time in that one district alone.

Mr. Clarkson advised that discrimination should be used from the first with regard to the list of buildings. The index, in its main features, might be in existence in a couple of years, and could be added to as additional information came in.

The Chairman spoke of the scheme as one of great value, and referred to the part which Mr. Owen Fleming had taken in connexion with it. He might say, in reply to the questions, that a Roman wall would be a fit subject to deal with, and that the appointment of consuls should be left to the sub-committee. In county histories descriptions of buildings were to be found which were suggestive of things to be looked at. He was glad to hear what Mr. Appleton had said about the measurement of old work, which was of more use to students than any amount of mere sketching. He could also endorse what Mr. Appleton had said about London, for many years ago he used to take the opportunity, at times when there was little traffic about, of roaming through out-of-the-way streets, and he was astonished at the amount of interesting bits of old work he came across. He was rather sorry to hear Mr. Pratt say that as soon as an architect got into practice he had not time to measure anything. Such men as Street and others might be referred to as refuting that idea, and he hoped that many of them, even when they did get into practice, might not find it so entirely absorbing as to allow no time for picking out a little bit of work to be measured or sketched.

Mr. Appleton's motion was then unanimously agreed to, as was the vote of thanks.

Mr. Appleton briefly replied.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

The inaugural address of this Association for the present session was delivered by Mr. Hugh Alexander (Chairman of Council), Chief Sanitary Inspector, Shoreditch, at the Westminster Town Hall, on the 5th inst. In the course of it he said,—My first duty and privilege in the position I occupy by your favour this evening is to congratulate you on the great success that has attended our Association during the past four years. Like good and enduring institutions generally, its foundations being well laid, it has grown from its inauguration steadily, but surely, in popular estimation and in the good opinion of sanitary inspectors throughout the country, until now we number 200 members, 27 hon. members, including the names of many of the most distinguished scientists of the day; and 13 associate-members, who are gentlemen of position, interested in sanitary science in various ways. We have occasion also to rejoice greatly that the movement is spreading widely all over the land. One branch, which numbers fifty-two members, has been formed for the North-Western district, with its head-quarters at Liverpool; another branch, which numbers forty-eight members, has been formed for the Midland division, with its head-quarters at Birmingham; and several others are projected in various large centres of population.

This is a record which I cannot but regard as full of promise that before long all the competent sanitary inspectors in the kingdom will be roused from indifference, and will take their stand shoulder to shoulder with their comrades in defence of their own interest and the interests of the public, which are one and indivisible in the great cause of sanitary reform.

And now, gentlemen, as I am sure of your concurrence in my estimate of what has been done, so also I am sure of your full sympathy for a few words in recognition of our great indebtedness to our distinguished President (Mr. Edwin Chadwick, C.B.), not only for the prestige our Association enjoys in having at its head a gentleman whose name is honoured throughout the world as the pioneer of sanitary reform, but for most valuable active interest in the development of our cause, the full success of which promises to be a fitting crown to a long life of the very highest usefulness devoted to the interests of the State, and to the interests of our common humanity.

I would also, in your name, like to bear testimony to the worth of our late energetic Chairman, and our invaluable secretary and treasurer, and to their self-sacrificing labours in laying down the foundations, and subsequently guiding the fortunes, of the Association during the first four years of its existence. It was not a light undertaking for those gentlemen in the early days of our formation, to gather together the units of our force, and to give purpose and direction to its movements. Inspectors in those times were very much like "Hal' o' the wynd:" every man "fought for his own hand," and no one gave effective support to, nor received help from, the disorganised army to which he belonged, and the whole force was discredited in public estimation simply and solely for want of guidance and organisation. This was our condition when these three gentlemen pushed to the front and raised the standard of "The Association of Public Sanitary Inspectors," around which we are gathered this evening. Mr. Jerram has left the chair, and the Association has already testified its high appreciation of his labours. Mr. Legg still continues, and, I trust, will long continue, in the position of secretary, which he has so long filled with credit to himself, and with signal advantage to the Association. Mr. Raymond also retains his position as treasurer, a position in which he has won the high respect and gratitude of the Association for the very able manner in which he has discharged the duties of that important office.

What legislation may be proposed in the coming session we must be prepared to examine dispassionately, and disinterestedly, from the vantage-ground of our knowledge and experience of the law as it stands, and of the changes which we perceive are needful, that we may, so far as we are able, prevent misdirection in legislation; for we must by no means overlook the fact that it is quite possible changes may not mean improvement, either for the public or for the officers of the public. It is therefore the duty of the Association, being forwarned, to be forearmed, and your Council, taking this view of their duty, and looking forward to the time which is now drawing near, presented so far back as March, 1886, a report on "the impending changes in sanitary law," as affecting initial procedure, and the powers, responsibilities, emoluments, and status of sanitary inspectors, which report was presented by a deputation, introduced by our President, to the President of the Local Government Board, and received most favourably.

Gentlemen, that report was not adopted in hot haste, in the face of a Government Bill, but in quiet deliberative council eighteen months ago. In that report, while legislation was yet far off, it was declared that sanitary inspectors were placed in positions of great responsibility, armed with totally inadequate powers to efficiently respond to the expectations of the public; and that is the case still. That the sanitary enactments were unnecessarily complicated, unreliable in administration, and not calculated to encourage zealous officers in efforts to secure prompt abatement of nuisances, and they continue so to this day. It is further declared in the Council's report that the most essential amendments required in sanitary law to secure efficient administration are:—(1) That sanitary officers should be duly qualified, and should only be removable from their position by local authorities, for misconduct, neglect of duty, or proved incompetence. (2) That sanitary officers should be held more directly responsible for the abatement of nuisances, and should be required on their own responsibility to serve notices on behalf of local authorities, requiring all necessary works to be done for that purpose, such notices to be read to the local authority or committee appointed for such purpose at their next meeting, and if approved to be adopted, and proceedings ordered to be taken for the abatement of nuisances. Penalties to accrue from the date of inspector's notice. (3) That more simple, stringent, and summary powers should be given for the abatement of nuisances; and lastly, that a minimum rate of salary should be enacted for sanitary inspectors.

It is pretty certain that everyone will agree to the proposition that only a properly qualified man should be appointed to the important and responsible position of a sanitary inspector; but when we come to definitions, public opinion requires guidance and direction; and, above all, local authorities, with whom rests the appointment of sanitary inspectors, should be restricted and protected in their selection of those officers by an enactment defining and prescribing essential qualifications in candidates for that position.

The absence of any legal or authoritative judgment upon the essential qualifications of sanitary inspectors, and the results naturally arising therefrom, suggested to the members of the Sanitary Institute of Great Britain nine or ten years ago the propriety of instituting examinations and granting certificates of efficiency; and it is reported that 238 aspirants have, up to June of this year, passed those examinations, and have gone forth stamped with the certificate of the examining body as fitted to fill the position of sanitary inspectors. But as to the examination, and as to the certificate of efficiency, there exist grave doubts as to the sufficiency of the one, or the reliability of the other, as a guarantee to the public of efficiency.

It has been said by some members of the Sanitary Institute that some form of examination must be better than none; but, on the other hand, it is alleged by experienced sanitary inspectors that unless an examination is all that it should be, its certificate of competency must be misleading and mischievous. The examination of the Pharmaceutical Society protects the public against poisoning, by taking care that only skilled and properly trained men are allowed to dispense medicine. A medical officer of health must be a man who has devoted his whole life to the acquirement of medical knowledge; and a sanitary inspector, whose business is not to cure diseased bodies, but to cure disease-breeding houses, it is contended should be a man trained and skilled in building construction, so that he may be competent to detect and to correct the errors and the misdeeds of builders and builders' workmen, and even the mistakes of architects, and to diagnose and trace out the hidden causes of disease, otherwise he and the dwellers in houses will be largely at the mercy of interested persons. Can it be maintained that any man taken from any walk of life is sufficient for these things, if coached for a few months, so as to secure the certificate of the Sanitary Institute? I think not; and I am not alone in that opinion. Mr. Cubitt Nichols, the adviser of the Home Office on Artisans' Dwellings Schemes, gave it in evidence to the Royal Commission on the Housing of the Working Classes that, in his opinion, all inspectors ought to be acquainted with building construction, and that even disciplined men of good character, like old soldiers, who are sometimes employed, are of no use unless they have served in the Royal Engineers. This testimony, from a gentleman of large experience and high authority, was fully supported by Mr. Owen, the secretary to the Local Government Board, and by Mr. Edwin Chadwick, our President.

The evidence of these eminent gentlemen I may very fitly supplement with the expressed opinion of the Chairman of the Council of the Sanitary Institute itself, Captain Douglas Galton, one of our honorary members, and one of our most valued friends. In his address, read at the annual meeting of the Sanitary Institute, May 26th of this year, an address full of interest and suggestiveness, there is this passage as to treatment of infectious disease:—"The occurrence of a case of infectious disease in any house should be in itself taken as an index of the possibility of defects existing, and should be *prima facie* ground for a thorough examination of the premises and the surroundings by skilled persons."

I quite agree with Captain Galton, for I must assume he means men skilled and experienced in building construction. Nevertheless,—and it is something extraordinary,—it is not required by the Sanitary Institute that candidates for its certificate shall be practical and experienced builders; on the contrary, we cannot help observing that men whose life-long avocations have not had the slightest affinity with building operations of any kind, have been successfully coached up, and have passed the Institute's examination, and are now ready at any time, with the aid of the certificate they have secured, to assume the functions of a sanitary inspector.

We all remember that this examination was instituted ostensibly to improve the status and efficiency of sanitary inspectors, but there can exist no doubt in the mind of any experienced and observant sanitary inspector that it has

missed its aim from the very first, and that its certificate, granted as it is, wholesale to men who are not acquainted practically with every detail of building operations, is delusive and dangerous to the public, and, instead of elevating the position of sanitary inspectorship, tends largely to its degradation. I adduce in evidence of that the fact that it was some time back publicly and ostentatiously announced (as a rather good thing) that a labouring man, employed on a railway, had passed the examination of the Institute. And that announcement was followed very shortly afterwards by an advertisement issued by the vestry of a large metropolitan parish, for a man who held the certificate of the "Sanitary Institute" to fill the position of sanitary inspector, and the reward unblushingly offered for the man who held that distinction, a distinction certifying that he was a fit and proper man to discharge the duties devolving upon a sanitary inspector, was 30s. per week,—that is to say, the wages due to, and often obtained by, unskilled labourers.

Out of evil cometh good occasionally, and in this instance it was really fortunate that the members of the Vestry referred to were so mean as to permit the issue of such an advertisement, for, as the result showed, they had correctly gauged the value of the certificate of the Sanitary Institute, and they demonstrated its entire worthlessness to the public, in the fact that they had no trouble in getting what they wanted, and for the money they offered.

I will make no further comments on the facts I have adduced and the opinions I have quoted than this,—that they incontestibly demonstrate the necessity for a proper definition by law of "the essential qualifications required in a Sanitary Inspector," and to that I will only add and submit the following questions to you, and to enlightened local authorities, and to society generally:—(1) Can the certificate of the Sanitary Institute be regarded as a reliable guarantee of efficiency in any man seeking an appointment as a sanitary inspector? (2) Does the examination and certificate of the Sanitary Institute tend to improve the status and consequent efficiency of sanitary inspectors? or does it not rather tend to degradation and levelling down to the status of a day labourer?

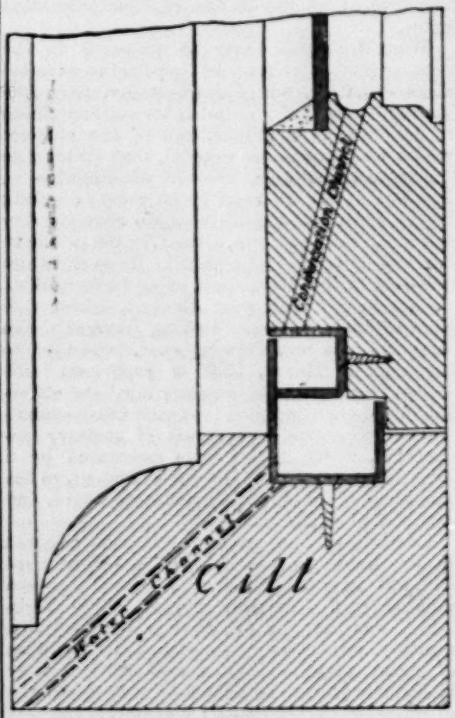
ARCHITECTURAL SOCIETIES.

Manchester Architectural Association.—The ordinary fortnightly meeting of this Association was held on the 15th inst., in the Diocesan Buildings, Mr. T. Chadwick in the chair. Mr. J. Corbett, Sanitary Engineer, read a paper on "House Hot-water Fittings," which was elaborately illustrated. The development was traced from the crude "set pot" or water-box in a cooking-range, to the present cylinder, with its necessary circulating pipes, safety valve, &c. Special appliances were described for intercepting and removing deposits of lime and mud from the boiler. Necessary precautions against frost were described, and instances were quoted of collapsed cylinders, frozen pipes, damaged boilers, &c. A vote of thanks, proposed by Mr. Hodgson, seconded by Mr. Woodhouse, and supported by the chairman, was carried unanimously.

Leeds and Yorkshire Architectural Society.—At the second meeting of the present session of the Leeds and Yorkshire Architectural Society, an address was delivered by Mr. Basil Champneys, of London, on "Victorian Architecture and Originality." Mr. H. Perkin, one of the vice-presidents, presided. The lecturer said that architecture was very much guided by precedents, and was bound more than any other art by mechanical and mathematical laws. It would therefore be unreasonable to expect any rapidity in its development or progress. They could find but two great original styles of architecture evolved by the inventive powers of humanity,—Greek and Gothic. In public taste, which must always be a factor in the development of style, there was no guidance for architects. But, however bad the conditions were, he saw no reason for despair so long as architects were not expected to do too much. Victorian architecture had accomplished a great deal, and had formed a scaffolding for successful enterprise in the future. It had shown that the essential principles of the two great schools of architecture had been mastered. By no conscious effort of originality would real progress come about. A vote of thanks to Mr. Champneys for his lecture was proposed by Mr. Corson, seconded by Mr. Connon, and supported by Principal Bodington, of the Yorkshire College. Referring to a remark made by Mr. Connon, Mr. Bodington said that the very essence of success lay in their having an instructed public to deal with. It seemed to him that the basis of national art was to educate the public to whom they had to appeal. Those who had seen the Manchester Exhibition had been amazed at the strength and fruitfulness of English art in painting. He could not help thinking that if they could see collected together the best architectural works of the last fifty years, it was quite possible they might stand amazed at the fruitfulness and strength of English architecture.

ELLIOTT'S "PERFECT SIMPLEX" METAL WEATHER BAR.

This bar is adapted for all kinds of casements opening inwards, and is applicable to existing windows and doors. As will be seen by the accompanying section, which represents the casement when closed, the lower bar is constructed in sectional shape, somewhat like the letter ⌊, and is screwed into a groove formed in the cill, the highest side of the bar being on the outside; or it can also be screwed on to an ordinary cill without forming any groove at all. The bar is



pierced in one place at the bottom, and a hole is also bored through the cill to carry off the condensation or other water that may accumulate in the bottom of the bar. The top bar is somewhat similar in shape, but of a smaller section, and is screwed into a rebate formed on the outer edge of the casement. This bar is also pierced to convey the condensation down through the bottom rail, as shown. The lower external angle of this bar is bevelled to form a drip, which is fixed flush with the bottom edge of the rebate in the sash. The long edge of the bar fixed on the casement laps on the top of the long edge of the bar fixed in or on the cill, and forms the outside joint of the casement, consequently the short edge of the small bar touches the inside face of the cill bar.

This weather-bar, which speaks for itself as to its efficiency, is manufactured by Mr. Samuel Elliott, of the Albert Joinery and Moulding Mills, Newbury.

Melbourne Centennial Exhibition, 1888. As some misapprehension appears still to exist respecting the dates fixed in connexion with the allotment of space and the opening of the Melbourne Centennial Exhibition, we are requested by the Agent-General for Victoria to state that, as at present arranged, the opening ceremony will take place on the 1st of August, 1888, and that applications for space will be received up to the 31st of December next at the offices of the London Commission, 8, Victoria-chambers, Westminster.

ARCHITECTURAL ASSOCIATION.

"OUR SKETCHING CLUB SCHEME."

Sir,—Will you kindly allow me to invite the assistance of all who take an interest in the proposal made in the paper on "Our Sketching Club Scheme,"* either by volunteering to act as vice-consuls or, if not able to undertake the regular duties, to furnish us with particulars of any buildings of interest they are acquainted with? Any information forwarded to me at 157, Wool Exchange, Coleman-street, E.C., will be most gratefully acknowledged. It should be tabulated in the following manner:—

Subject.	Name.	Place.	County.	Date of work, or style.	Architect.	Any features of particular interest.	Remarks. Especially note if illustrated or not.

We hope that the value of such a register will be sufficient to induce all who have the power to forward the movement to the utmost of their ability.

Herbert D. Appleton.

November 21st, 1887.

A SYMBOLIC STONE.

Sir,—After reading the article on "Christian Symbolism in Great Britain" which appeared in the number of your journal for the 5th inst., I am induced to call the attention of the writer or some member of the Surrey Archæological Society to an interesting specimen illustrative of the subject which is now lying by the roadside near Weybridge, about a mile out of the town, and close to the barge-cut of the river Wey; in fact, at present it does duty as a guard-stone to prevent carts, &c., damaging the Pelican Inn.

Although broken into two pieces, it will, on inspection, be found to be part of the cover of a stone coffin, and bears carved upon it part of a cross and an inverted omega over another.

When put together it measures about 3 ft. long, and appears to have been broken where the transept of the cross would occur, so that originally it must have been about 7 ft. in length. The omegas are very clearly defined.

I was informed that it was brought out of old Weybridge Church during its restoration.

The belief that it is well worthy of an inspection by some one interested in these matters, and that it deserves a better resting-place than it now has, is my excuse for troubling you with this note.

William Gibbon.

P.S.—I enclose a rough sketch of it as I saw it a month ago.

MITCHAM LINOLEUM COMPANY'S COMPETITION.

Sir,—In your Note on the above in last week's issue [p. 695] you do not make any mention that the Company reserve the right to buy any of the designs sent in, and not premiated, at one guinea each. Now this price, for anything of a design, drawn to 18 in. by 18 in. and coloured, is ridiculously small, even for the draughtsmanship. I think if the company were to alter this clause and allow an unsuccessful competitor to give them the refusal of his designs, at a price to vary say from one to three guineas each, they would obtain more designs of a higher class; for competitors must bear in mind that "many will run and there are but few prizes."

V. S.

*** We have received other letters raising the same objection, which we consider a very reasonable one.

THE METROPOLITAN BOARD OF WORKS SCANDAL.

Sir,—Referring to Mr. Richardson's speech, reported in the *Financial News* of Saturday last, in which a Mr. Fuller is stated to have bought a book of reference from one of the officials, I have challenged Mr. Richardson to give the name and address of the Mr. Fuller referred to, and I now beg to disclaim all knowledge of such a transaction.

I am most desirous that this letter should have publicity, as I am the only surveyor practising in London by the name of Fuller who is a Fellow of the Surveyors' Institution.

George J. Fuller.

Palpit, Truro Cathedral.—In our issue of the 12th inst. (p. 659), the pulpit of Truro Cathedral is described as being constructed of "Hopton Wood stone, from the Wirksworth quarries in Nottinghamshire": it should have been "Derbyshire."

The Vintners' Company.—Mr. William Wimble, of Queen Victoria-street, has been appointed architect and surveyor to this company.—*City Press.*

* Printed in this week's *Builder*.

PROVINCIAL NEWS.

Newcastle-on-Tyne.—The foundation-stone of the new College of Medicine, Newcastle, was laid on the 3rd inst., by the Duke of Northumberland. The design of the new structure is Elizabethan, and the site is in the Bath-road. The building is planned so as to leave a quadrangle in the centre. The western and southern sides are not being built at present, but in the future will be available for the extension of the physiology department, laboratories, animal pathology department, and a wing containing a residential hall for fifty students. The college now being erected consists of the principal and north front, facing Bath-road, and the east wing. This wing contains the anatomical department. On the ground-floor is the dissecting-room, 70 ft. by 30 ft., lit by a "ridge-and-furrow" roof. Adjoining are a large locker-room and lavatory. On the same floor is the anatomy theatre (for 150 students) and professors' private room. Above is a bone room, 20 ft. by 20 ft., and another room, 20 ft. by 15 ft. There is a basement, containing a summer dissecting-room, 20 ft. by 20 ft.; two rooms, 41 ft. by 30 ft., and 30 ft. by 28 ft.; a mortuary and infectious rooms, with private yard; also a heating vault, coal-cellar, store-rooms, &c. The walls of this wing are lined out with glazed bricks. The main front contains the entrance, in the centre under a tower, with oriel window corbelled out above the archway. On the right and left are rooms for the porter and registrar. The remainder of the ground-floor is occupied by the council and professors' room, 35 ft. by 25 ft., with a large bay window; a materia medica room, 25 ft. by 25 ft.; and a smaller lecture theatre, 38 ft. by 25 ft., having a private room for the professor and a dark room opening from it. An oak staircase, with double flights of steps, leads to the upper floor, which contains the library and examination hall, 80 ft. by 35 ft., and the museum, 60 ft. by 35 ft. The mullioned windows are being carried out in stone, and the walls and dressings in red bricks and terra cotta. The architects are Messrs. Dunn, Hansom, & Dunn, of Newcastle, and the principal building contract is in the hands of Mr. S. B. Burton, of Newcastle, and amounts to 15,000*l.*, the first portion of the building being entrusted under a 2,000*l.* contract to Mr. Walter Scott, also of Newcastle. The Normanby Brick and Tile Company, Middlesbrough, have the order for the red facing and moulded bricks, and Messrs. Doulton & Co., Lambeth, the terra cotta. Mr. Relph is the clerk of works. The total cost of the building will be about 25,000*l.*

Stourbridge.—On the 14th inst., Earl Beauchamp inaugurated the new Town Hall at Stourbridge. The building is Renaissance in style, the material used being red brick, with terra-cotta for the ornamental work. There are two main entrances from Market-street, and one for artistes, as well as one from Smithfield to the back of the room. The hall is 76 ft. by 46 ft., and in addition it has a stage 34 ft. wide by 26 ft. deep. The height to the ceiling is 38 ft. A gallery at the opposite end of the stage will accommodate about 200 persons, and the floor of the hall will seat over 800. The doors have been fitted with double axle hinges, and there are eight exits from the hall to the corridors and six external exits. Cloak rooms, lavatories, and other accommodation, have been provided. The hall is lighted by ten windows, five on each side, of cathedral tinted glass, in stone mullions. The building is heated by hot-water pipes, supplied by Messrs. Jones & Attwood. In addition to the Town Hall the Commissioners are building in connexion with it, and of uniform design, a suite of public offices. The Commissioners' Room, which is to be 38 ft. long by 21 ft. wide, will have a strong room attached. There will also be offices for the Town Clerk, collector, surveyor, and other officials. One of the entrances to the Town Hall has been carried upwards so as to form a tower 100 ft. high, connected with which is an open balcony 55 ft. high. At the back of the public offices there will be the new fire-engine station, and this will be accessible from Smithfield. The total cost of the hall is about 4,500*l.*, and that of the Town Offices and Corn Exchange it is estimated will be 2,400*l.* more. The architect is Mr. T. Robinson, of Stourbridge, the contractor being Mr. J. Guest, also of Stourbridge.

DISSENTING CHURCH-BUILDING NEWS.

Honor Oak.—Two memorial stones of a Baptist school-chapel at Honor Oak, between Peckham and the Crystal Palace, were laid recently. The building will consist of a school-chapel measuring 61 ft. 6 in. by 32 ft. 6 in. inside, having a partly open-timbered roof and ceiled at a height of 25 ft., with inner and outer front lobbies, all doors opening outwards; and a vestry, 10 ft. by 12 ft., &c. The style is Early Gothic, and the materials to be used externally are red brick with Bath stone dressings, and slated roofs. The contract for the chapel has been taken at 1,093*l.* by Messrs. F. & H. F. Higgs, of Loughborough Junction. Dwarf walls and iron railings are to be erected around the whole of the site, upon which a new church is to be erected within four years, when the building now in progress will be used as a school. This is the second chapel erected during this year under the auspices of the London Baptist Association, the first being at Cann Hall-road, Stratford, which was opened in the Spring. The architect of both buildings is Mr. George Baines, of Great Winchester-street, London.

Newton (Leeds).—The memorial stones of a new chapel for the accommodation of Baptists and Congregationalists were recently laid at Newton, near Leeds. The exterior of the new building will be in the fourteenth-century Gothic, slightly decorated, with an octagon end to Chapeltown-road. In the centre of the octagon the principal entrances and portico will be placed, and above there will be an apsed end of three two-light windows, supported with flying buttresses, and finished in gablets. Above the latter there will be a central clock tower with traceried lights and dials in four sides. The scheme will entail the expenditure of 5,000*l.* or 6,000*l.*, exclusive of the site. Accommodation will be provided for over 500 worshippers. The building will be well lighted and have clearstory windows. The work will be carried out from the designs of Mr. Archibald Neill, of Leeds.

Whetstone.—The memorial stone of a new Congregational school-chapel at Whetstone has recently been laid. The style of the building is a very simple treatment of the Early Gothic. It is faced with white bricks with Bath stone dressings, and tiled roofs. The accommodation on the upper floor consists of the school-chapel, 60 ft. by 35 ft., seating about 350 adults, with a vestry, tea-making room, &c. Two fireproof staircases lead down to the lobbies. On the ground-floor will be an infants' class-room, 25 ft. by 18 ft.; a lecture-room, 30 ft. by 35 ft., with vestry, 14 ft. by 11 ft.; and five class-rooms, 13 ft. 9 in. by 9 ft. 6 in. each A corridor 6 ft. wide leads to the lecture-room and class-rooms. It will be heated by hot water. The contract for the main building, including lighting, heating, &c., is 2,007*l.* The architect is Mr. George Baines, of Great Winchester-street, E.C., whose designs were accepted in a limited competition. The builder is Mr. R. G. Battley, of Old Kent-road, S.E.

York.—A new Wesleyan chapel was opened in Bishopthorpe-road, York, on the 13th ult. The building will seat about 650 persons, has been erected from designs prepared by Mr. C. Bell, of London, and is in the free Italian style of architecture. It contains, besides the chapel proper, a spacious schoolroom with fifteen class-rooms opening into it, as well as an infants' schoolroom, &c. The cost will be upwards of 6,000*l.*

STAINED GLASS.

Blackburn.—Viscount Cranborne a few days ago unveiled a stained-glass window which has been placed in the west end of Christ Church, Blackburn, at a cost of about 300*l.* The window has been erected, as an inscription on it indicates, as a "Jubilee" memorial. It is the work of Mr. Swaine Bourne, of Birmingham. The subjects treated are eleven in number, eight being arranged in two rows in the lights, with architectural canopies.

Charlton Abbots.—The east window of the Parish Church has been filled with stained glass, illustrating Faith Hope, and Charity. The work has been designed and executed by Messrs. Warrington & Co., of London.

Grappenhall. — The parish church of St. Wilfrid, Grappenhall, near Warrington, has just received a considerable addition of stained glass. The present work consists of two five-light windows representing the "Adoration of the Magi" and "Christ with the Four Evangelists"; two four-light windows illustrating "The Feeding of the Multitude" and "Acts of Charity"; and one window of three lights. This latter window contains nearly all the ancient glass, dating from the fourteenth century, which was scattered about in various windows in the church. These pieces have now been collected, and an arrangement designed to bring them into use, so that the whole should form one complete window. These additions were entrusted to Messrs. Mayer & Co., of Munich and London.

Longton.—A special service has been held in St. James's Church in dedication of two two-light windows which have been placed in the chancel as a memorial to illustrate and perpetuate the life and work of the Rev. Adam Clarke, late rector of the parish. The subjects of the windows were selected by a committee, and are as follows:—1, As teaching the ignorant, "Our Lord Instructing Nicodemus"; 2, As comforting the afflicted, "Our Lord Comforting Martha and Mary"; 3, As feeding the hungry, "Our Lord Feeding the Five Thousand"; 4, As visiting the sick, "Our Lord Visiting St. Peter's Wife's Mother." Each subject has been made to run through two lights, and is framed with architectural canopies and bases of late fifteenth-century character. The work was designed and executed in the studios of Messrs. Heaton, Butler, & Bayne, of Garrick-street, London.

Rochester.—A three-light stained-glass window has just been placed in St. Nicholas Church, Rochester, in commemoration of her Majesty's Jubilee. It is the gift of Mr. W. Patten-Haymen, J.P. The lights are composed of heraldic devices, with emblems, &c., a large portrait bust of the Queen being placed in the quatrefoil. A similar window for the same church has also been placed as a memorial of the late Alderman Charles Foord by the family of the deceased gentleman. Both windows have been executed by Messrs. W. James & Co., Willes-road, Kentish Town.

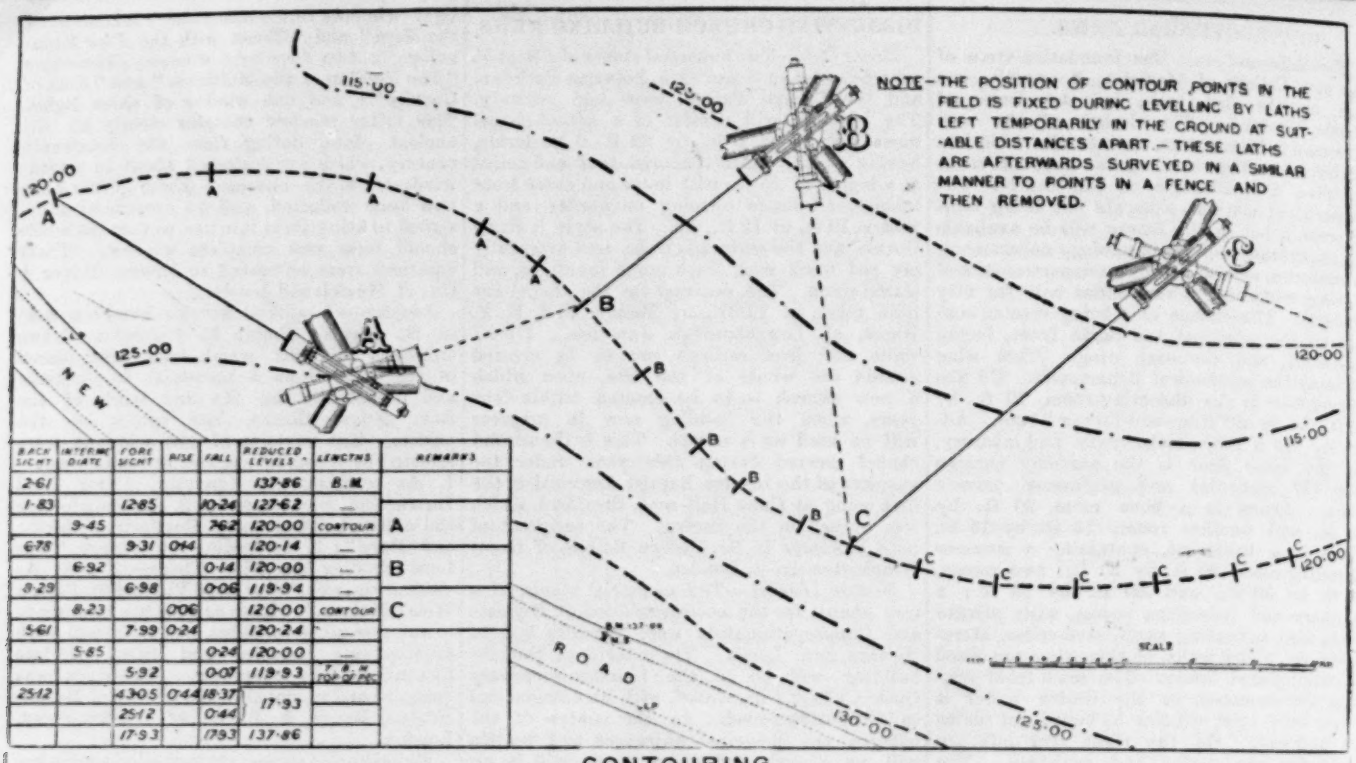
St. Columb (Cornwall).—St. Columb Minor Church, Cornwall, has recently been enriched by the fixing of a four-light window at the east end. It represents four of the subjects from Our Saviour's life, viz., "The Annunciation," "The Adoration," "The Baptism," and "The Saviour blessing the Children." They are surrounded by rich floral canopy work on alternate blue and ruby grounds, the bases being in keeping. The window is to the memory of the late Mr. Thomas Nicholls, and was carried out under the superintendence of the Vicar by Messrs. Gibbs & Howard, of Charlotte-street, Fitzroy-square, London.

Swansea.—Sir John Morris, Bart., has lately had erected, at his seat, Havod, Sketty Park, a large painted window, to commemorate the Jubilee of Queen Victoria. In addition to a representation of Her Majesty and the royal symbols, the window contains the Morris arms, and the national emblems of England, Ireland, Scotland, and Wales are worked in as a ground-work to the whole. The window has been designed and executed by Messrs. Chas. Evans & Co., London.

Wakefield.—The west window of St. Mary's Church, Wakefield, has been filled with stained glass by way of memorial to the late Misses Scott, of St. John's, Wakefield. Figures of some of the greater prophets occupy the chief lights, with the patron saint and angels in the tracery. The work is from the studio of Messrs. Powell Brothers, of Leeds.

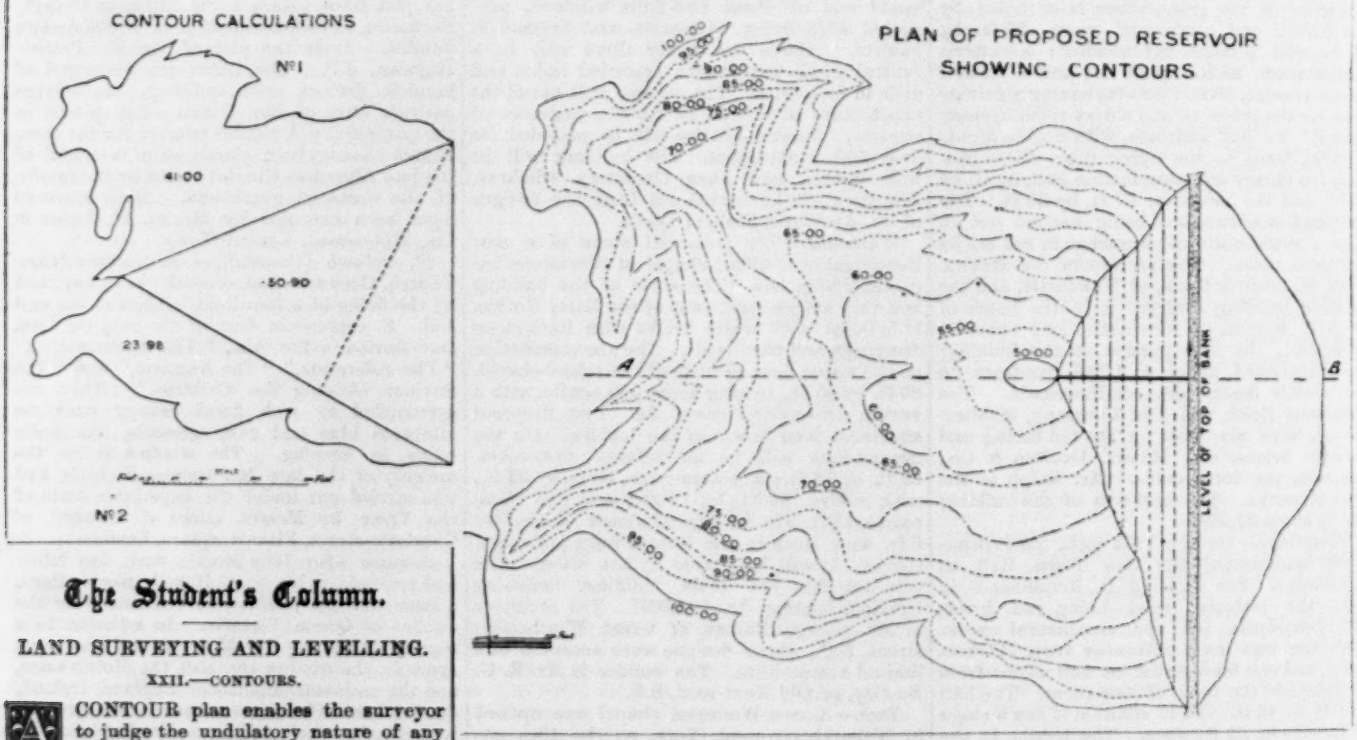
Widdrington.—A two-light painted window to the memory of Mary Ann Hill Firth and Mary Ann Firth, relatives of the vicar, has recently been executed for this parish church by Messrs. Chas. Evans & Co.

Destruction of a German Castle by Fire. Last week the famous Castle of Jever, in Oldenborg, was almost completely destroyed by fire and water. The castle is the autumn residence of the Grand Duke of Oldenborg, whose arrival had been announced, and it is thought that excessive heating of the stoves of the castle caused the fire. The building, formerly the ancestral home of the Dukes of Anhalt Zerbot, was one of the oldest in Germany, and famous for its fresco paintings and Gobelins tapestry. There is also a fine picture-gallery. Fortunately all these art treasures, as well as the antique furniture, were saved.


NOTE - THE POSITION OF CONTOUR POINTS IN THE FIELD IS FIXED DURING LEVELLING BY LATHS LEFT TEMPORARILY IN THE GROUND AT SUITABLE DISTANCES APART. - THESE LATHS ARE AFTERWARDS SURVEYED IN A SIMILAR MANNER TO POINTS IN A FENCE AND THEN REMOVED.
115·00
120·00
125·00
130·00
NEW ROAD
SCALE

BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVELS	LENGTHS	REMARKS
2·61					137·86	B.M.	
1·83		12·85		10·24	127·62	—	
	9·45			7·62	120·00	CONTOUR	A
6·78		9·31	0·14		120·14	—	
	6·92			0·14	120·00	—	B
8·29		6·98		0·06	119·94	—	
	8·23		0·06		120·00	CONTOUR	C
5·61		7·99	0·24		120·24	—	
	5·85			0·24	120·00	—	
		5·92		0·07	119·93	T.B.M. TOP OF PEG	
25·12		43·05	0·44	18·37	17·93		
		25·12		0·44			
		17·93		17·93	137·86		

CONTOURING.



The Student's Column.

LAND SURVEYING AND LEVELLING.

XXII.—CONTOURS.

A CONTOUR plan enables the surveyor to judge the undulatory nature of any ground, and in setting out work to run lines approximately of equal level or of uniform gradient. It is prepared in the following manner. Suppose the altitude of the contour required to be 120 ft. above a given datum, and that the nearest reliable bench mark is known to be at a level of 137·86 ft. above the same datum, there is a difference of 17·86 ft. between the level of the bench mark and the required contour. The instrument is set up in a convenient position and adjusted, and if, for example, the staff reads 2·61, this is booked as a back-sight and shows the line of collimation to be at a level of (2·61 plus 137·86) 140·47 ft. above the given datum. Now the contour being 20·47 ft. below this, it is evident that the line of collimation must be lowered in position before a level staff, 14 ft. or 16 ft. long, could be read by the instrument when set up level. A fore-sight for the purpose of connecting the levels is taken in such a position that the staff is read near the top, say at 12·85, and the level is re-set in a new position to read near the foot of the staff, say 1·83. Reducing the book we find the level of the point upon which we changed the level of the line of collimation to be 127·62. The position of this point is not recorded in the level book, as it is not required to be indicated upon the plan, but we have by this means fallen from a known level of 137·86 to a known level of 127·62, and have now only to fall 7·62 ft. lower to find the position of a point upon the required contour. Adding 7·62 to 1·83 we obtain 9·45 as the necessary reading upon the staff to give the height required, and this figure is then booked for reference in the intermediate column. If the staff reads less than 9·40 the staffman is told to go to lower ground, whereas if the staff reads more than 9·50, the staffman is told to come to higher ground. Except where extreme precision is required, the divisions indicating hundreds may be disregarded in reading the staff, but it is well to observe them in the Level Book for sake of accuracy in connecting the levels. Signals will have to be agreed upon by which the surveyor can communicate with the staffman when they are too far apart to be within hearing of one another. The position of the contour points in the field is fixed during the process of levelling by stout laths pointed at the ends, so as to be left temporarily in the ground at suitable distances apart. The number of laths required will entirely depend upon the intricacy of the ground and the size of the features. Laths are placed in positions determined by levelling at such points as will best define the shape of the contour, and these laths are afterwards surveyed in a similar manner to points in a fence. It is advisable only to level and lath out as much as can be surveyed before leaving the ground for the day.

The plan of the proposed reservoir shows contours at heights having an interval of 5 ft. between them. The altitudes are supposed to range between 50 ft. and 100 ft. Watersheds are indicated by a salient or outward bend in a contour line; watercourses by a re-entering bend in the contour line. The vertical interval at which the contours are to be levelled having been decided, a line of section is taken (sometimes called "the initial line"), upon which pegs as temporary bench marks are fixed near the level of each contour, and in running the required contours the instrument is set up so that the telescope, when levelled, may intersect the levelling staff which is held upon the initial point, or top of each contour peg, in order to arrive at the reduced level to be read upon the staff for tracing the required contour.

The areas of the contours enclosed can be best arrived at with the use of a planimeter (*Builder*, Oct. 29th, p. 618). The diagram indicates the method of calculating the area enclosed by the top bank contour. In this case the enclosure being large it is divided into three parts, and

one side being straight a triangle is formed in the centre the area of which can be most accurately calculated in the ordinary way by multiplying the base by half the height, as it would be waste of time to go round the boundary of any regular geometrical form with the planimeter. The two adjoining enclosures to the triangle being irregular in outline are more accurately determined by the planimeter than by drawing "give and take lines" in the usual way.

The subjoined table gives a systematic method of drawing up the statement of capacities.

CALCULATION OF CAPACITIES.

Reduced Level.	Sq. ins. Area on paper.	Area in sq. feet.
50·00	0·46	1656
55·00	3·38	12168
60·00	12·53	45108
65·00	21·24	76464
70·00	34·42	123912
75·00	49·04	176544
80·00	61·52	221472
85·00	74·52	268272
90·00	87·44	314784
95·00	111·03	363708

PROPOSED RESERVOIR.

Mean Areas.	Depth.	Cubic feet.	Content in cubic feet up to level.	Capacity in gallons up to level.
6912	× 5	34560	34560	55·00 / 216000
28638	× 5	143190	177750	60·00 / 1110938
60786	× 5	303930	481680	65·00 / 3010500
100188	× 5	500940	982620	70·00 / 6141375
150228	× 5	751140	1733760	75·00 / 10836000
199008	× 5	995040	2728800	80·00 / 17055000
244872	× 5	1224360	3953160	85·00 / 24707250
291528	× 5	1457640	5410800	90·00 / 33817500
339246	× 5	1696230	7107030	95·00 / 44418937

Area of Top Bank Level 9·58 acres.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

16,701, Excavating. T. Whitaker.

This invention has for its object the application of the steam-crane machinery to excavating. On the jib of a portable crane a swinging arm is swivelled. This carries an excavating-bucket with a hinged or movable bottom, so as to allow the contents to escape. The bucket is provided near the top with a stirrup or bow, by which it is suspended to the hauling-chain of the crane, and is so arranged that in excavating the pull of the chain is always in a direction parallel to the face of the cut, and not direct to the jib head. Or the chain of a horizontally-moving crane carries an excavating-bucket, which is guided up and against the face of the cutting by a radius rod projecting from the wagon. When the bucket is full it is swung round and emptied into a wagon behind the crane, or into any other desired place.

16,811, Door Checks, &c. H. House.

This invention relates to a door check after the American pattern, but the arm, instead of being straight, is curved, and the end runs against a cylindrical buffer which gives ease and certainty of motion. Mechanism for regulating the pressure of the spring, &c., is also adaptable.

16,847, Bolts for Doors. F. H. Collins.

Instead of attaching the thumb-bit, push-piece, or knob rigidly to the rod, it is by this invention allowed to have a slight rocking motion lengthways, and on the underside are formed two slots or recesses, one at each end of the part traversed by the thumb-bit. Into one of these slots one of the studs can fall, where it is retained by the action of a spring attached to the rocking thumb-piece. When the bolt is shot the stud nearest the fore end is engaged in the corresponding slot on the back plate. When it is desired to withdraw the bolt, the pressure of the fingers first causes the thumb-bit to rock on the disengaged stud, and withdraw the other stud out of the slot in which it was locked. The thumb-piece can then slide to the other end of the traverse, when the second stud falls into the other slot, and is secured by the action of a spring aforementioned.

8,939, Concrete Pavements, Floors, &c. J. & J. Crombie.

According to this invention the area to be covered is flagged with a layer of sand, and on this is arranged a system of moulding boards, which divide the area to be paved into the number of flags or slabs required. Then a layer of calico, cloth, cardboard, or some such suitable material is placed so as to make a fair and level surface, and to prevent the bed from being disturbed by the concrete when it is put into the mould. By this a level surface on both sides of the flags is ensured; the top sides of the flags being trowelled in the usual manner to make them smooth. The joints are treated with plumbago to prevent adhesion.

12,638, Flooring or Decking for Bridgework, &c. A. W. Ramage.

This invention relates to flooring or decking used in bridgework, culverts, landing stages, piers, &c., or for fireproof structures designed to bear a great strain per given area. It is impossible to describe in detail the improvements, but steel or iron in suitable segments is used, the decking being filled in with concrete or similar substance.

12,821, Weather-guard for Doors, Windows, &c. S. Pitt.

The guard which is the subject of this invention, instead of being in the usual form of a strip, is made of a cylinder or roller held by a spring, and so made as to effectually shut out draught. The inner part of the roll is elastic, while the outer portion is of hard felt or some durable substance.

NEW APPLICATIONS FOR PATENTS.

Nov. 11.—15,406, A. Orr, White Lead.—15,426, H. Walker, Firestoves.—15,437, W. Smethurst, Curtains, Doors, or Divisions for Theatres, &c.

Nov. 12.—15,467, G. Bulmer, Ventilators.—15,475, T. Letheren, Silent Water-waste Preventer Cistern.—15,476, E. Lofts, Ventilating.—15,483, J. Boulter, Automatic Indicator for Water-closets.—15,509, R. Oakley, Warming and Ventilating Buildings.—15,520, W. Stanford, Jointing Stoneware and other Pipes.

Nov. 14.—15,527, G. Davis, Fireproof Revolving Screen for Grates, &c.—15,531, J. Dyson, Inlet Ventilators.—15,542, T. Worthington, Ventilating Sewers and Drains.—15,545, J. Lawrence, Bellows Regulators for Water-closets.—15,560, B. Finch, Fireproof Scenery, and Doors for same, for Theatres, &c.

Nov. 15.—15,596, J. MacKnight, Artificial Pavement.—15,603, W. Payne, Pivoting Fanlights, &c. &c. — 15,626, A. and R. Kerr, Wood-working Machinery.—15,634, J. Gay and F. Wood, Firebricks, &c.—15,655, F. Scheidemann and F. Bender, Hinges.—15,666, G. Layton.

Nov. 16.—15,690, G. Wood, Manufacture of Glass.—15,739, J. Stephens, Portland, Roman, and other Cements.

Nov. 17.—15,763, A. Haslam and J. Settle, Fireplaces or Grates.—15,764, J. Stevenson, Fastening Sashes, Windows, Doors, and Shutters.—15,769, R. Bucknall, Folding Roof Trusses and Pillars.—15,771 and 15,773, F. Crane, Varnishes.—15,781, T. Abbott, Folding Wall-ladder and Fire-escape.

PROVISIONAL SPECIFICATIONS ACCEPTED.

12,383, B. Cocker, Protection for Gas-piping in Case of Fire.—12,900, T. Morris, Slate Working Machinery.—13,127, A. Stephenson, Butt Hinge and Method of Fixing to Doors.—13,524, W. Hearn, Fastening Windows.—13,688, H. Gross, Kilns for Bricks, Tiles, &c.—14,281, J. Petter, Fireplaces.—14,422, G. Newman, Door Springs and Checks.—14,545, M. Frankenburg, Parquetry Wood Flooring.—14,556, J. Stones, Fireproof, Iron, or other Curtains for Theatres and Large Openings.—14,634, J. Newton, Rocking Basin Water-closet Apparatus with Trap.—14,716, A. Hopkins, Wood-block Flooring.—2,817, H. Moore, Self-locking Bolt for Doors.—13,472, J. Coppard, Closing or Opening Doors, Windows, &c.—13,576, W. St. Aubin, Window-sash Fasteners, &c.—13,928, J. Hind and F. Sharp, Automatically Opening Doors from the Interior of Buildings in Cases of Emergency.—13,946, H. Whiteley, Opening and Closing Fanlights, &c.—14,206, D. Sorfleet, Automatic Wind and Rain Excluder for Doors.—14,847, B. and C. Townend, Draught, Dust, and Rain Excluder for Doors.—15,114, G. Sonnenthal, Pile Drivers.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

14,707, R. Longe, Communicating with Upper Stories of Buildings in Case of Fire, &c.—734, T. Royle, Preservation of Wood, &c.—12,366, J. Crighton and S. Robertson, Flushing Cisterns, &c.—678, E. Jones and C. Brand, Paving Blocks from Scoria or Slag.—698, O. Elphick, Water Waste Preventers.—1,954, G. Smith, Door Fasteners and Locks.—5,796, W. Holland, Automatic Discharge Valve for Water-closet Cisterns and Tanks.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

NOVEMBER 15.

By SAMUEL B. CLARK & SON.

Perthshire, near Dunkeld Station—The residence called Cardney, and 1,074 acres, freehold £9,050

By ROGERS, CHAPMAN, & THOMAS.

Balham, Ormeley-road—Branksome, term 92 years, ground-rent 7*l.* 510
Muswell Hill—Ground-rents of 54*l.* 12s., reversion in 96 years 1,150

By DRIVER & PERFECT.

Highbury—11, Elfort-road, 89 years, ground-rent 6*l.* 250

By PERKINS & CESAR.

New Cross-road—No. 106, freehold 825

By A. & A. FIELD.

Stepney—17, Walter-street, 27 years, ground-rent 1*l.* 200
Marylebone—Improved ground-rent of 1s. a year, for nine years, with reversion to 40*l.* a year for 18 years 105
6, Harcourt-street, 5 years, ground-rent 8*l.* 60
Walworth-road—No. 108, Profit rental of 8*l.*, term 23 years 75

By FAREBROTHER, ELLIS, & Co.

Northampton, near—Horton House, with mansion, advowson, and 2,550 acres, freehold 40,000
A perpetual rent-charge of 54*l.* 16s. a year 1,260
Hackleton—Freehold house and shop 350
The Hackleton Working Men's Club and a plot of land, freehold 150
An enclosure of freehold land, 8a. 3r. 8p. 590
Isleworth—The freehold residence, Pendennis, and grounds 1,900

NOVEMBER 16.

By BAXTER, PAYNE, & LEPPER.

Green-street Green, Kent—Two enclosures of freehold land, 17a. 0r. 7p. 1,350
Beckenham—The residence called Rosslyn, 80 years, ground-rent 35*l.* 1,900
Deptford—77, Church-street, freehold 250
Lambeth—306, South Lambeth-road, 52 years, ground-rent 7*l.* 570

By FLOOD & SONS.

Woodford, near—The freehold beerhouse called the Prince of Wales 705
Notting Hill—No. 142, Portobello-road, 72 years, ground-rent 8*l.* 490
14, Buckingham Mews, 72 years, ground-rent 4*l.* 10s. 135

By TATTERSALL, BARR, & Co.

South Kensington—25, Ifield-road, 68 years, ground-rent 8*l.* 345

By GIBLIN & CHILD.

Islington—22, Linton-street, 48 years, ground-rent 6*l.* 490

NOVEMBER 17.

By WOOD & TAYLOR.

Camberwell—Picton-street, a plot of freehold land 55

By A. Watson.

Walthamstow—Hatherleigh-road, a plot of freehold land	£165
Suffolk Park-road, two plots of freehold land	130
Hammersmith—5, Richford-street, freehold	500

By W. A. Blakemore.

Wood Green—1 and 2, Deborah-villas; 1 and 2, Oak-villas; and 1 and 2, May Cottages, freehold	1,220
Pimlico—15, Pulford-street, 50 years, ground-rent 3l. 15s.	310

By Daniel Watney & Sons.

Limehouse—57 and 59, North-street, freehold	225
Bromley—215 and 221 odd, Devon's-road, freehold	800
Poplar—47 and 53 odd, Pennyfields, copyhold	780
4 and 5, Turner's-buildings, copyhold	240
Stepney—19 and 20, Mary-street, 19 years, ground-rent 4l. 10s.	90
Upper Clapton, High-road—Three freehold houses with shops	3,500
1 and 2, Northwold-road, freehold	710
Horley, Surrey—Lee-street Farm, 27a. 1r. 28p., freehold	860

By Newbon & Harding.

Islington—28, Compton-terrace, 30 years, ground-rent 10l.	700
Camden Town—Improved ground-rents of 60l., term 73 years	790
Stoke Newington—41, Queen's-road, 72 years, ground-rent 8l.	300
Canonbury—49, Halton-road, 31 years, ground-rent 10l.	335
Clerkenwell—26, Myddelton-street, 16 years, ground-rent 7l.	250

November 18.

By Jones, Lang, & Co.

City—10 and 11, Aldermanbury, 15 years, ground-rent 350l.	1,860

By Mr. Gaiger.

Hyde Park—16, Cambridge-street, 32 years, ground-rent 10l.	1,335

By Crawter & Son.

Hackney—48 to 58 even, Moye-street, freehold	790
9, York-street, freehold	400

MEETINGS.

Monday, November 28.

Society of Arts (Cantor Lectures).—Mr. H. H. Statham on "The Elements of Architectural Design." I. 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. J. W. Connon on "The Legal Registration of Architects." 7·30 p.m.

Tuesday, November 29.

Institution of Civil Engineers.—Further discussion on Sir F. A. Abel's paper on "Accidents in Mines." 8 p.m.

Wednesday, November 30.

Society of Arts.—Mr. J. B. Hannay on "Economical Illumination from Waste Oils." 8 p.m.

Thursday, December 1.

Parkes Museum.—Sir Douglas Galton, F.R.S., on "Smoke and Fog." 5 p.m.

Friday, December 2.

Architectural Association.—Mr. F. T. Baggallay on "Perspective Drawing." 7·30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. W. Metcalfe on "The Classification of Continuous Railway Brakes." 7.30 p.m.

Saturday, December 3.

Association of Public Sanitary Inspectors.—Dr. W. Collingridge, M.A., on "The Duties of Port Inspectors of Nuisances." 6 p.m.

Miscellanea.

Tottenham Surveyorship. — A correspondent writes:—"The Tottenham Local Board having advertised for the services of an engineer and surveyor, ninety-five candidates applied for the appointment, from which the following six were selected:—Messrs. F. W. Lacey, Brentford; F. Wike, Leicester; G. P. Laffan, Bridgwater; T. Bennett, Cheshunt; A. T. Davis, Stratford-on-Avon; and J. E. Worth, Burslem,—all of whom attended, with the exception of Mr. Wike, of Leicester, who had withdrawn. None of the candidates could have satisfied the requirements of the majority of the Board, judging from the fact that after interviewing them separately, they passed a resolution to select and interview six others. This treatment very naturally did not meet with the approval of the selected applicants, as Mr. Worth, of Burslem, threatened to, and Mr. Lacey, of Brentford, did, withdraw from the contest. The extraordinary resolution, however, above referred to was on the 15th inst. rescinded, and Mr. Worth was appointed Surveyor to the Board without opposition."

Awards at the Adelaide Exhibition.—With reference to the list of awards at the Adelaide Exhibition published in our issue of the 12th inst. (p. 684), we are asked to mention that Mr. J. F. Ebner's exhibit of mosaic, parquet, and artistic joinery, has been awarded a diploma of the first order of merit.——It should also have been mentioned that Messrs. Steven Bros. & Co., of Upper Thames-street, London, and Milton Ironworks, Glasgow, have been successful in securing the first award for their kitcheners, and the same for their ornamental and architectural ironwork, at the same Exhibition.

British Archæological Association.—At the meeting of this Association on the 16th inst., Sir James A. Picton, F.S.A., President, in the chair, an interesting series of sketches of ancient buildings and recently-discovered antiquities was exhibited by Mr. J. T. Irvine, the greater number being found in the neighbourhood of Peterborough. Mr. Thomas Blashill exhibited photographs of the Roman buildings at Treves. Mr. Williams exhibited some mortar of flint-like hardness, which had been sawn out of the Roodeye wall, Chester, as an example of the mortar used in its composition. There are a few fragments of Roman brick in its composition. After some other exhibits, a paper was read by the President on the walls of Chester. After referring to the differences of opinion relative to the age of the walls which have recently been put forth, the belief was expressed that the truth would be arrived at only by a critical investigation, not only of the walls themselves but of the historical records. This the lecturer had endeavoured to accomplish. Commencing with the notices of old writers, many curious facts were elicited. Thus Giraldus Cambrensis speaks of the great quantity of Roman buildings which remained in his time. Roger de Hoveden, William of Malmesbury, Matthew Paris, and Higden, all speak of the walls, and the latter mentions the stones laid like the work of Hercules. Turning to the present condition of the walls, Sir James gave the results of the recent excavations. After comparing the ruins of Chester with the destruction of Anderida, which also remained desolate for many years, he referred to the continuous existence of Roman walls at both places. Turning to a series of elaborate plans showing the construction, he indicated that at all the points where excavation has been made and some others Roman masonry is visible. Speaking of one of the sculptured stones, on which the figure appears with a stole, he quoted Horace to show that stoles worn by women were sometimes worn by men. An animated discussion followed, in which Mr. George R. Wright, F.S.A., described the fortunate coincidence which enabled the members of the Association to visit the walls during the recent Congress. Mr. Blashill referred to the construction of the Porta Nigra, Treves, in which no mortar was used, the masonry being put together with metal cramps. Mr. Loftus Brock, F.S.A., reported the latest results of the excavations, which at the Roodeye, he said, showed that the wall is backed up by 13 ft. of solid concrete.

Engineering Feats.—Our contemporary *Iron* says that "a very interesting engineering work is in progress at the New England Railroad Bridge over the Connecticut, north of Hartford. The new bridge, which is of steel, is to stand exactly where the old wooden one is, and the problem was how the work was to be done without interfering with the traffic. It is being effected in the following manner. A number of piles were driven, those under the eastern spans going 30 ft. into the river-bed, and being 50 ft. long. Above these piles temporary work was constructed to support the track, which was built up higher than it used to be. Then the trusses of the old bridge were removed in sections, and the old roadway remained held up by the piles and temporary work. It had been raised enough to leave a space where it used to be, and here the roadway of the new bridge is being put in. Thus the steel bridge is being built in the place of the wooden one, and when it is completed, all that remains will be to remove the elevated wooden track bed and let the trains run on the new bridge. The steel bridge will rest temporarily on the piling until its trusses are in place." To this we may add that such feats as this are not unknown in this country, though perhaps our renewals are on a smaller scale. For instance, a new iron girder bridge has been for some time in course of erection on the London, Chatham, and Dover Railway, just south of the Elephant and Castle station. This bridge, like its predecessor, carries four lines of rails. The old bridge was of iron, and its removal was necessitated by the widening of the Walworth-road at this point. The old bridge has been removed, the abutment set back some 8 ft. or 10 ft., and the new bridge is in course of construction, without raising the level or altering the course of the rails, and without any interruption of the traffic beyond the slackening of the speed of the expresses as they pass over the heavy wooden staging or temporary bridge, which has three ways beneath it, one for foot passengers, one for the tramway line, and one for ordinary vehicular traffic. The cross-beams which carry the longitudinal railway sleepers of this temporary bridge are so arranged that, now that the three main girders of the bridge are in position, the cross-girders are pushed in between the temporary cross-beams and connected to the main girders. When this work is completed the temporary bridge will be relieved of its duty and removed. The contractors for the work, which is being carried out under the direction of Mr. Mills, the Company's engineer, are Messrs. Young & Co., of Pimlico.

Tramway Extensions in the Metropolis. The period has now arrived for giving notices in respect of Private Bill projects for the next Parliamentary session, which it is expected will include several applications for tramway extension in different parts of the Metropolis. In response to a memorial presented to them by upwards of 12,000 of the residents and owners of property in Balham and Tooting, the London Tramway Company are about to take the necessary steps for obtaining Parliamentary sanction for extending their lines from the present terminus at Clapham, through Balham and Upper Tooting, to High-street, Lower Tooting. From the company's present terminus the proposed extension would proceed along the east side of Clapham-common, thence along the Balham High-road, and on to Tooting, a distance of about three miles. The company will apply for powers to lay down a double line along the entire distance. In the session of 1886 a body of promoters designated the South Metropolitan Company sought similar powers. The project received the necessary sanction of the District Board and the Metropolitan Board of Works, subject to the roadway being made 47 ft. throughout. This proviso caused the promoters to withdraw their application. The Holborn Board of Works will support an application by the North Metropolitan Tramways Company for powers to extend their lines from Clerkenwell-road to the City boundary.

The New Roman Catholic College Buildings at Tooting.—The extensive new Roman Catholic College at Tooting, which, when completed, is intended to be occupied as an educational establishment in connexion with St. Joseph's College at Clapham, is being rapidly proceeded with, the building having already been carried to the height of three stories. The site upon which the College is being erected embraces, with the grounds, an area of about 18 acres. It is known as the Hill House Estate, which was some time since purchased by the Roman Catholic authorities. The estate was for many years in the possession of Alderman Venables, a former Lord Mayor of London, who occupied it as his country seat. It is bounded on the north-west side by Church-lane, Mitcham-road, Tooting, and extends in an easterly direction from the burial-ground of Tooting parish church to the southern boundary of Tooting Common. The portion of the site fixed upon for the college buildings forms about the most elevated part of the grounds, from which there is a commanding view southward of the country around. The college buildings will cover a ground area of something like 25,000 ft., having frontages of about 200 ft. and 125 ft. respectively, the structure containing four stories besides a deep basement. The elevations are faced with red brick and stone dressings. Mr. W. Harvey, of Whitehall-place, is the architect, and Messrs. Higgs & Hill are the contractors, the amount of their contract being about 30,000*l*. The cost of the land is said to have been a little more than 15,000*l*.

Public Baths at Battersea.—The Battersea Vestry are about to erect public baths for the parish. The site fixed upon forms a portion of the Latchmere Allotments estate, about the centre of the parish. The baths will contain two spacious swimming-baths, one first-class and one second-class, the arrangement being that on certain days in the week they are to be exclusively set apart for females. There will also be provided ten first-class and thirty second-class slipper baths, for males, whilst for females there will be six first-class and fourteen second-class baths of a similar character, the entire number of private baths provided being sixty, with a corresponding number of dressing-rooms. The designs for the baths have been prepared by Mr. Rowland Plumbe, architect. The estimated cost of the baths, including furnishing, is 15,000*l*.

The West End and Wimbledon Railway Works.—The construction of the new line of railway between the Putney Bridge terminus of the Metropolitan District line and Wimbledon, which is now in course of construction by the London and South-Western Company, will, it is stated, be followed by the erection of an extensive new station at South Kensington by the last-named company, to be known as their West-end terminus. The completion of the new route across the Thames from Fulham and Putney to Wimbledon will enable the South-Western Company to run main-line trains direct from South Kensington. The works between Wimbledon and Putney are being actively pushed forward, and are expected to be completed and opened early in the ensuing year, but the through traffic between South Kensington and Wimbledon cannot be commenced until the completion of the bridge across the Thames, which forms the heaviest portion of the undertaking. The construction of this bridge, which will cross the Thames immediately to the east of the new Putney Bridge recently erected, is, we understand, to be commenced next spring. It is stated that the site of the intended new station at South Kensington will be almost identical with that on which the South-Western Company proposed to erect a West-end terminus a few years since. This site, for which the company then obtained Parliamentary powers, is on the north-west side of Fulham-road, and embraced the property known as Pelham-crescent, and other property in the immediate locality adjoining the present South Kensington Station. The designs and plans for the intended new station were prepared, and the works were to have been commenced, but after being postponed for one or two years subsequently to the company obtaining their Act the undertaking was for the time abandoned.

Registration of Plumbers.—Mr. W. R. E. Coles, Secretary of the Worshipful Company of Plumbers, London, was present in the City Chambers, Glasgow, on the 21st inst., and distributed Certificates of Registration to a number of the principal master plumbers, as also journeymen, of Glasgow and the West of Scotland. Mr. W. P. Buchan proposed that Councillor W. R. W. Smith, who was present, should be empowered to arrange with the Hon. the Lord Provost for a public meeting to be held as soon as convenient to formally inaugurate the movement and appoint a local committee, which was agreed to. The business closed with votes of thanks to Mr. Coles and Councillor Smith for their attendance.

The Office of City Architect.—Mr. Charles Barry, Mr. W. H. Crossland, and Mr. Alexander Peebles are amongst the candidates for this appointment.

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	6 5 0	7 10 0
Teak, E.I. ....load	8 0 0	12 10 0
Sequoia, U.S. ....foot cube	0 2 3	0 3 0
Ash, Canada ....load	3 0 0	4 10 0
Birch ,, ...	2 0 0	3 10 0
Elm ,, ...	3 10 0	4 10 0
Fir, Dantsic, &c.	1 10 0	4 0 0
Oak ,, ...	2 10 0	4 10 0
,, Canada	3 0 0	6 0 0
Pine, Canada red	2 0 0	3 10 0
,, yellow	2 0 0	4 0 0
Lath, Dantsic ....fathom	3 0 0	5 0 0
St. Petersburg	4 0 0	5 10 0
Wainscot, Riga ....log	0 0 0	0 0 0
,, Odessa, crown....	2 10 0	3 0 0
Deals, Finland, 2nd and 1st...std.100	7 0 0	8 0 0
,, 4th and 3rd	5 10 0	6 10 0
Riga	5 10 0	7 0 0
St. Petersburg, 1st yellow	8 10 0	13 0 0
,, 2nd ,, ...	7 0 0	8 0 0
,, white	6 10 0	8 10 0
Swedish	6 0 0	14 0 0
White Sea	0 0 0	0 0 0
Canada, Pine, 1st	16 0 0	24 0 0
,, ,, 2nd....	10 0 0	15 0 0
,, ,, 3rd, &c....	6 0 0	9 0 0
,, Spruce, 1st	8 0 0	9 0 0
,, ,, 3rd and 2nd.....	5 0 0	7 0 0
New Brunswick, &c....	5 0 0	6 10 0
Battens, all kinds	4 0 0	10 10 0
Flooring Boards, sq., 1 in., prepared, First	0 8 0	0 11 0
Second	0 6 6	0 7 6
Other qualities	0 4 0	0 6 0
Cedar, Cuba ....foot	0 0 3	0 0 3½
Honduras, &c.	0 0 2½	0 0 3½
Australian	0 0 2	0 0 3
Mahogany, Cuba	0 0 4½	0 0 7
St. Domingo, cargo average	0 0 4½	0 0 6
Mexican	0 0 3	0 0 3½
Tobasco ,, ...	0 0 3½	0 0 5
Honduras ,, ...	0 0 3½	0 0 5
Maple, Bird's-eye	0 0 5	0 0 7
Rose, Rio ....ton	8 0 0	11 0 0
Bahia....	7 0 0	9 0 0
TIMBER (*continued*).	£. s. d.	£. s. d.
Box, Turkey ....ton	5 0 0	12 0 0
Satin, St. Domingo ....foot	0 0 5	0 0 9
Porto Rico	0 0 6	0 0 10
Walnut, Italian	0 0 3½	0 0 5
METALS.	£. s. d.	£. s. d.
Iron—Bar, Welsh, in London...ton	4 15 0	5 0 0
,, ,, in Wales	4 5 0	4 10 0
,, Staffordshire, London	5 10 0	6 0 0
Copper—		
British, cake and ingot ....ton	0 0 0	0 0 0
Best selected	55 10 0	56 10 0
Sheets, strong....	62 0 0	0 0 0
Chili, bars	51 10 0	52 0 0
Yellow Metal....lb.	0 0 0	0 0 0
Lead—		
Pig, Spanish ....ton	12 12 6	0 0 0
English, common brands....	13 0 0	0 0 0
Sheet, English	13 17 6	0 0 0
Spelter—		
Silesian, special ....ton	17 5 0	17 10 0
Ordinary brands....	17 0 0	17 2 6
METALS (*continued*).	£. s. d.	£. s. d.
Tin—		
Straits....ton	146 0 0	0 0 0
Australian	146 0 0	0 0 0
English ingots	143 0 0	0 0 0
OILS.		
Linseed ....ton	19 2 6	19 7 6
Cocoanut, Cochin	30 0 0	31 0 0
Ceylon	23 10 0	0 0 0
Palm, Lagos	21 10 0	0 0 0
Rapeseed, English pale	26 15 0	0 0 0
,, brown	25 5 0	25 10 0
Cottonseed, refined	20 5 0	0 0 0
Tallow and Oleine	25 0 0	45 0 0
Lubricating, U.S.	5 0 0	6 0 0
,, refined	5 0 0	12 0 0
Turpentine—		
American, in casks ... .cwt.	1 4 9	0 0 0
Tar—		
Stockholm ....barrel	0 15 0	0 0 0
Archangel	0 10 6	0 0 0

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Public Library and School of Art....	Doncaster Corporation	50*l.* and 25*l.*	Jan. 10th	ii.
Hotel and Boarding House, Douglas (I. of M.)	Mr. Louis Kelly	25*l.*	Not stated...	ix.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Constructing and Sewering Road, Norwood ...	Governors, Whitgift Foundation	Blake, Haddock, & Co.	Dec. 1st	ii.
Pipe-Sewer, &c.	Surbiton Imp. Com. ...	*Official*	Dec. 5th	ii.
Rebuilding Steam Laundry, Windsor	....	.....	do.	ii.
Clearing Site, &c.	St. Mary Abbott's (Kensington) Vestry	W. Weaver.....	Dec. 6th	ix.
Postal Sorting-Office, Herne Hill.....	Com. of H.M. Works...	*Official*	do.	ix.
Making-up and Paving Road	Wandsworth Bd. of Wks	do.	do.	ix.
Re-Erection of Iron and Slate Urinal.....	St. Mary, Islington	do.	Dec. 7th	ix.
Supply of Stores, &c.	Great Northern Ry. Co.	do.	do.	ii.
Widening Bridge	Greenwich Bd. of Wks.	do.	do.	ix.
Sewerage Works	Horsham U. R. S. A....	do.	Dec. 12th	ix.
Kerbing, Tar-Paving, Gravelling, &c.....	Lewisham Bd. of Wks.	do.	Dec. 13th	ix.
Engine Repairs	West Ham Council	Lewis Angell	do	ix.
New Post-Office, London Bridge	Com. of H.M. Works...	*Official*	Dec. 20th	ii.
Enlargement and Alterations to Schools	School Brd. for London	do.	Not stated...	ix.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Two Borough Surveyors' Assistants	Reading Corporation ...	100*l.* each	Dec. 7th	xiv.

TENDERS.

BETHNAL GREEN.—For the rebuilding of shop premises, for Mr. E. Woodhead. Mr. J. W. Brooker, architect, 13, Railway Approach, London Bridge, S.E.:—

M. Allen	£780 0 0
Royal & Co.	780 0 0
Burman & Sons	591 0 0
W. & F. Croaker	588 0 0
R. G. Battley	585 0 0
A. Garratt & Son (accepted)	563 0 0

CAVERSHAM (near Reading).—For detached house on the Ivy Cottage Building Estate, for Mr. Geo. Manning. Mr. W. R. Talbot, architect, Caversham:—

A. W. Dodd	£450 0 0
W. A. Jones	410 0 0
Geo. Pilgrim....	397 0 0
G. & T. Ruffell	385 0 0
A. J. Carter	354 0 0
Patience & White, Reading (accepted)	339 0 0

CAVERSHAM (near Reading).—Accepted tenders for a detached villa, for Mr. David Cox. Mr. W. R. Talbot, architect, Caversham:—

Bricklayer, &c.—W. Ivin, Caversham.
Carpenter and Joiner.—A. J. Carter, Caversham
Plasterer.—Alfred Bridgman, Caversham.
Mason.—Wm. Jones, Reading.
Slater and Tiler.—Wormsley & Co., Reading.
Plumber and Smith.—C. H. Tucker, Reading.

[Work to be done under schedules, at an estimated sum total of £780.]

CHELSEA.—For the erection of a Cookery Centre on arches, and new water-closets for the girls and infants, in connexion with the "Fox" School, Silver-street (Chelsea X). for the School Board for London. Mr. T. J. Bailey, architect:—

G. Wilkinson & Sons	£1,221 0 0
Cowley & Drake	1,114 0 0
T. Bendon	1,113 0 0
Norris & Luke	1,049 0 0
W. Johnson	997 0 0
Stimpson & Co.*	985 0 0

* Recommended by the Works Committee for acceptance.

CHELSEA.—For alterations at the Stanley public-house, King's-road, for Mr. A. Rehm, Mr. J. W. Brooker, architect:—

Smith & Son	£1,369 0 0
Wm. Downs	1,274 0 0
Mark	1,239 10 0
Jackson & Todd	1,220 0 0
W. & F. Croaker	1,176 0 0
R. G. Battley	1,098 16 0
Royal & Co. (accepted)	1,040 13 0

FOREST GATE.—For new roads, sewers, &c., for the British Land Company (Limited), on their Forest Gate Estate No. 3. Mr. Henry B. Michell, surveyor:—

Killingback, Camden Town	£2,365 0 0
Catley, Pentonville	2,100 0 0
Smith, Barking	2,087 0 0
Cunliffe, Dorking	1,876 18 6
Cooke & Co., Battersea	1,875 0 0
Dunmore, Hornsey	1,805 0 0
Harris, Camberwell	1,774 0 0
Neal & Co., Wandsworth	1,750 0 0
Wilson, Walthamstow	1,744 0 0
Bloomfield, Tottenham	1,739 12 8
Nowell & Robson, Kensington	1,725 0 0
Nicholls, Wood Green	1,677 0 0
Pizzey, Hornsey	1,630 0 0
Peirl & Son, Bromley, Kent	1,594 0 0
Rowland Bros., Fenny Stratford.....	1,560 0 0
Jackson, Stratford	1,500 0 0
Kent, Bermondsey (accepted).....	1,487 0 0

HEMEL HEMPSTED.—For constructing a new iron bridge, 3[illegible] ft. span, and 20 ft. wide, near Boxmoor Wharf, Hemel Hempstead, for the Highway Board. Mr. W. A. Fisher, surveyor, Hemel Hempsted:—

W. W. Cranstone, Hemel Hempsted...	£187 0 0†
C. Chonk, Two Waters, Hemel Hempsted	135 0 0
W. Sear, Hemel Hempsted*	85 0 0
Westwood, Baillie, & Co., Poplar†.....	72 0 0†

* Accepted.
† Ironwork only.

LONDON.—For alterations at the Northumberland Arms public-house, Charing Cross, for Mr. W. Showell. Mr. J. W. Brooker, architect:—

H. Cocks....	£1,050 0 0
W. Downs	1,048 0 0
R. G. Battley	932 0 0
W. & F. Croaker	905 0 0
Burman & Sons	895 0 0
Royal & Co.	880 0 0
A. Garratt & Son (accepted).....	850 0 0

PENGE.—For erecting shops on forecourts of 117 and 119, Maple-road, for Mr. W. J. Bigwood. Mr. J. W. Brooker, architect:—

W. & F. Croaker	£260 0 0
E. Smith	237 10 0
Eustace	231 9 0
G. J. Kick (accepted)	230 0 0

NEW CROSS.—For alterations to forecourt, and new gates and railing, Wesleyan Chapel, New Cross-road, for the Trustees. Mr. John James Downes, architect, 183, Lewisham High-road, S.E.:—

Oldman	£127 0 0
Leng	127 0 0
Holloway	115 0 0
Best (accepted)	102 15 6

PUTNEY.—For new cemetery works, for the Burial Board of the Parish of Putney. Mr. J. C. Radford, C.E., surveyor :—

Geo. Belle	£10,290	0	0!
Wilson & Waln	10,000	0	0
A. Kellet	9,376	0	0
A. H. Lissaman	9,100	0	0
T. Grant	8,900	0	0
Richard Mayo	8,740	0	0
W. R. Williams	8,650	0	0
G. Osenton	8,443	0	0
G. Neal	8,100	0	0
J. G. B. Marshall	8,000	0	0
Tomes & Wimpey	7,786	0	0
Nowell & Robson	7,725	0	0
W. Blackmore	7,700	0	0
J. Mears	7,286	0	0
Chas. Killingback	6,990	0	0
A. Lucas (accepted)	6,829	10	0
Mackenzie (withdrawn)	5,995	0	0
S. Saunders (withdrawn)	5,982	4	0!

SOUTHBOROUGH.—For the enlargement of Christ Church, Southborough. Mr. Theodore K. Green, architect :—

Strange & Sons	£1,938	0	0
Gallard & Sons	1,798	0	0
J. Jarvis	1,690	0	0
Wallis	1,412	0	0
Cauty	1,363	0	0
Punnett & Sons	1,287	0	0

SOUTHEND.—For the works required in the erection and completion of barrack buildings, for the Salvation Army, in Clarence-road, Southend. Mr. E. J. Sherwood, architect, 101, Queen Victoria-street, E.C. Quantities by the architect :—

Scharien & Co., Chelsea	£1,538	0	0
W. Watson, Ilford	1,515	0	0
Baker & Wiseman, Southend	1,429	0	0
J. Munday, Wimbledon	1,420	0	0
S. Darke & Son, Southend	1,380	0	0
F. E. Woodhams, Southend	1,360	0	0
Newton & Idle, Clapham Common	1,349	0	0
J. W. Steward, Southend	1,330	0	0
G. Stephenson, Bishopsgate-street	1,324	0	0
Wm. Tout, Hendon	1,310	0	0
Mutton & Wallis, Gravesend	1,248	0	0
E. Jarvis, Banbury	1,185	0	0
F. J. Coxhead, Leytonstone	1,040	0	0

SOUTHWARK.—For alterations at No. 194, High-street, Borough, S.E., for Mr. E. Leftwich. Mr. J. W. Brooker, architect :—

Jackson	£559	0	0
T. Gilbert	484	0	0

WALWORTH.—For repairs and decoration at the Cottage of Content public-house, for Mr. L. Rehm. Mr. J. W. Brooker, architect, 13, Railway Approach, London Bridge, S.E. :—

Jackson & Todd	£238	0	0
A. Tompkins	235	0	0
T. Gilbert (accepted)	230	0	0
J. O. Rickardson	158	0	0

WANDSWORTH.—For pumps, &c., at the new workhouse of the Wandsworth and Clapham Union. Mr. T. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street :—

Wentworth & Co.	£1,295	0	0!
Hayward Tyler & Co.	950	0	0
Shand, Mason, & Co.	670	0	0
S. Owens & Co.	610	0	0!

WINCHMORE HILL.—For building five huts and nurses' home at the Northern Hospital, Winchmore Hill, for the Metropolitan Asylums Board. Messrs. Pennington & Bridgen, architects :—

Ward & Lamble	£5,755	0	0
Grover & Son	5,932	0	0
Lamble	5,549	0	0
Scrivener	5,493	0	0
Dearing & Son	5,484	0	0
Wall Bros.	5,289	0	0
Johnson	4,950	0	0
Lascelles	4,035	0	0
Norris & Luke	3,877	0	0

[Architects' estimate, £5,250.]

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W. P. B. (we cannot continue the correspondence under the circumstances).—O. W. D. (we quite agree with you. We have received other letters on the subject).—D. & B.—R. J. S.—A. L. R.—"Architect" (if you mean to move in the matter, better take legal advice. We do not think it is for the dignity of the profession to give public prominence to disputes of that kind).—H. I. N. (should send amount).—E. & Co. (too late).

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